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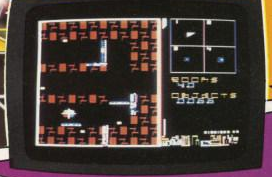

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ABC

Submitting articles
Commodore Horizons welcomes readers' contributions — either articles or program listings. Articles should be typed double-spaced with a wide margin. Programs should, whenever possible, be printed out on plain white paper, accompanied by a cassette. We cannot guarantee to return every article or program submitted, so please keep a copy. If you want to have your program returned you must include an s.a.e.

SUNSHINE

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EDITORIAL

COMPUNET IS THE latest in a small, but growing, number of databases designed to attract home micro users. Unlike its main rival, Micronet 800, Compunet only serves Commodore micros, though the range may be expanded later.

For £90 you receive a 1200/75 1200/1200 modem, the necessary software protocols and one year's free subscription to Compunet. You will be able both to upload your own messages and programs, and download free and commercial software. The modem will also help to prevent piracy, since downloaded software will only run on the micro used to access the program.

Compunet plans to offer a number of different services, including teleshopping, telebanking and even telepublishing. A range of information providers will be invited to contribute to the system, as will the software houses.

However, Compunet's predecessors, notably Compuserve, The Source and Micronet, have met with only limited success. Micronet, for example, was launched in March 1983, but 18 months later only has about nine and a half thousand subscribers. The technology may be here, but the great leap forward still has to be taken.

In part, this is due to the price of modems. The number of people likely to subscribe to networks such as Compunet would be a great deal higher if modems cost £50 or less. However, the price of modems does appear to be drifting downwards, albeit slower than we would like.

The other reason why networks have so far failed to realise their full potential is that they have not really made use of the medium on which they are based. Networks cry out for interactive facilities which will allow users to link up with each other and with databases. A network which just imitates the post office or the yellow pages is only duplicating services which already exist.

What is needed is imagination, and the perseverance to make the imagination work.

Are you only using

To only play games on a Commodore computer is like asking Albert Einstein to work out the square root of four.

The computer's brain barely ticks over.

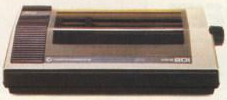
To really stretch it, you need more interesting software programs. For example, record keeping, interactive education, stimulating adventure games or word processing.

And for those you need peripherals.

Like a Commodore disk drive, a really fast storage and retrieval system with a vast memory.

Or a Commodore cassette unit, the inexpensive way of loading and storing programs.

For those who like the idea of text and graphics being more alive and having greater clarity than on a TV, there's the Commodore colour monitor.



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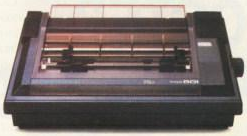

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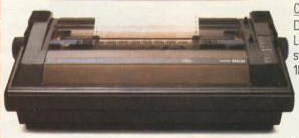

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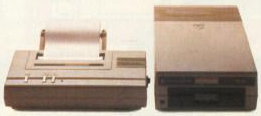

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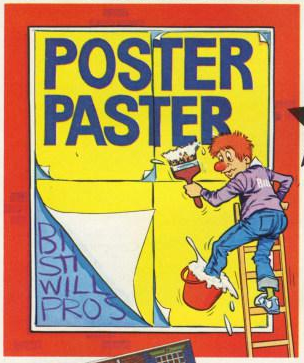

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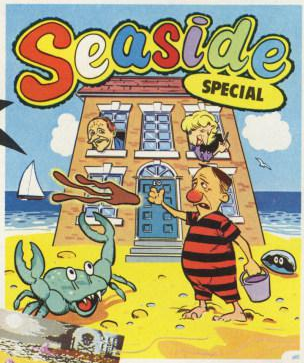

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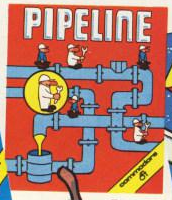

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LETTERS PAGE

Dataview address

I READ with great interest a news item under the heading of "DATAVIEW VALUE" in the Septemnber issue of Commodore Horizons.

I shall be grateful if you could correct two points — first both the products mentioned in the news item are published by a new company, Dataview Wordcraft Limited and secondly the address of Dataview Wordcraft Limited is Radix House, East Street, Colchester, Essex. Telephone No. (0206) 869414.

Amit Roy
Marketing Manager
Dataview Wordcraft Ltd

Merge solved?

A SUGGESTION I would like to make, regarding a query J.D.W. Sumner of Devon made in your Answer Back section regarding merging of listings, is that it is possible to overcome this problem without the need to purchase any specific software.

On the 64 carry out the following:— Load or type in first section of program then enter in DIRECT MODE Poke43, Peek(45)-2: Poke44, Peek(46). Follow this by entering NEW then load or type in second section of program, then enter again in DIRECT MODE Poke43, 1:Poke44,8.

When LIST is now carried out the two sections of programs will have merged and can be RUN as one program.

This is also possible on the Vic 20 if you first PrintPeek(43) and PrintPeek(44) then enter the first DIRECT commands as previous. Follow this by entering second section of program and then enter again in DIRECT MODE Poke43(X):Poke44(Y) where X and Y are the values obtained previously.

The line numbers for the two sections must be consecutive as any overlapping will erase – duplicate existing line numbers.

Kevin L Morton
Wakefield
Yorkshire

Mister Angry

HAVING purchased your magazine for some months I decided to try some of your programs for my Vic 20. Having spent a number of hours typing and checking they still won't run. I have checked them over and over again and I am 100% sure that they are as they appear in your magazine. I have tried them on three machines and all I get is a mass of symbols on the screen.

I don't expect you to print this letter in your magazine and even if you do I won't see it, because after all the hours of tearing my hair out I will not be buying your magazine ever again.

yours Angrily
Mr D. Rodgers
West Houghton

ALL *Commodore Horizons* **Software File programs are received on cassette, loaded, checked, printed out, and the printout is reproduced photographically. This doesn't leave much room for mistakes. Since Mr Rodgers won't be reading this, perhaps one of his schoolfriends will explain this to him.**

Blush blush

IN RESPONSE to a query from a J.D.W. Sumner regarding a merge routine for his '64', you recommended a software package from Supersoft.

As the reader was obviously 'into' writing his own programs, I was surprised that you did not recommend the excellent book *The Working Commodore 64* by David Lawrence, published by Sunshine Books.

Among the routines listed are 'MERGE', 'RENUMBER' and 'DELETE'. At a cost of £5.95 this represents a much greater value than any software package, particularly as there are many other useful routines in the book.

W J Cheesman
BFPO 15

We just don't like to blow our own trumpets!

Castlepoint club

MANY THANKS for your excellent magazine. It's a pleasure to have trouble free listings.

I have only been taking your mag for three months but I am frightened to ask about back copies. When did you start?

I would be pleased if you could mention our club. It's just been formed and we'd like more members. It's the Castlepoint Commodore Computer Club.

The club offers a rental library, bulk purchase offers, outings and excellent teach-ins by a brilliant young man, John Crockett.

Membership is £5.00 per year, £2.00 if you are unwaged, and 30p for meeting which is fortnightly.

J Elliott
116 Church Parade
Canvey Island
Essex

ALL BACK-issues of ***Commodore Horizons*****, apart from the first, Dec 83/Jan 84, are available from our subscriptions department.**

This is the chance to air your views — send your tips, complaints and compliments to Letters Page, Commodore Horizons, 12-13 Little Newport Street, London WC2R 3LD

NEWS DESK

Making micro music

THE CAPITAL Region Information Centre, part of the Micro-Electronics Education Program, is producing a booklet for music teachers and students entitled "Microcomputers and Music Education".

Following an introduction to the subject, the booklet will contain a list of useful software and hardware currently available, with a full section on the Commodore machines.

Organiser Nick Pickett said that despite the Commodore machines not being approved for use in schools by the Department of Mechanical and Electrical Engineering of the Inner London Education Authority, any information on the subject would be gratefully received.

To contribute information or get hold of the booklet, which should be available in September, contact Nick via the Music Department, Middlesex Polytechnic, Trent Park, Cockfosters, Herts.

Mirrorsoft makes games simple

GAMES CREATOR, from Mirrorsoft, is the latest in a line of programs designed to let non-programmers produce games.

Launched at the PCW show, the 64 Games Creator is written by David and Richard Darling, authors of the Galactic Games Designer for the Vic 20.

Games Creator comes with three games ready to play; Bounce, Hawk Patrol and Snake Pit, which cover maze, platform and Scramble-type scenarios. The program is menu-driven, and allows you to specify the type of alien used, movement patterns,

backgrounds, shooting rules, sound effects, music, sprite shapes, explosions and so on.

Mirrorsoft's Jim Mackonochie commented "Games design languages like ISP's Scope are excellent in their way, but for users who don't want to learn a new language we've put together Games Creator. We think it will be a big success with games players of around 12 years old and upwards, but we've also found that it's a help to more advanced programmers who want to try out games ideas before writing original programs."

Games Creator costs £12.95 on cassette and £15.95 on disk; contact Mirrorsoft, The Mirror Group, Holborn Circus, London.

Eureka! — £25K reward

EUREKA!, an epic arcade adventure from new company Domark, looks likely to set new standards of complexity — and there's a £25,000 "reward" at stake for the first person to complete it.

Dominic Wheatley — grandson of author Dennis — and Mark Strachan have set up the company with the intent of "blending the talents of many people into works of art." Eureka! consists of five adventure games, written by Fighting Fantasy author Ian Livingstone, and five arcade games. All the coding has been done by the Hungarian programmers of Andromeda Software.

The game is released in a single £14.75 package on October 31st, and any mail orders made before that date will have a guaranteed delivery date, so as to give a fair chance to all purchasers. Eureka! will be released to shops at a later date.

The epic contains around 250K of coding, and operates on a multi-load principle. Completing each arcade section allows access to the next part of the adventure, which is set in five different periods of history — Prehistoric Britain, Roman Britain, Celtic Britain, World War Two Germany, and the present-day Carribean.

Your mission is to find the shards of a shattered moon crystal, and the reward of £25,000 will be paid to the first person to achieve this.

Dominic Wheatley said "we're keeping future plans fairly secret, but some of my grandfather's books would lend themselves well to computer games, and we might also do something based on a cartoon character. There's very little limit to the ability of Andromeda Software's programmers!"

Contact Domark through Tigress PR, 127 Fawe Park Road, Putney, London, phone 01-871 1136.

Wheatley & Strachan — got it

Mermaid launches disk doctor

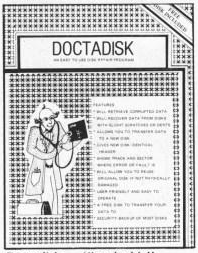
NEW COMPANY Mermaid Software has launched the first of a series of educational and utility programs.

Doctadisk is compatible with the 1541 disk drive and all D4 format drives including the Petdrive (170K).

It's a disk repair program which will retrieve corrupted data, recover data from disks with slight physical damage, and allows the data to be saved on a new disk which is given an identical header.

Mermaid's Harold Wolpert describes the utility as "an invaluable utility for serious disk users, saving hours of work in cases where disks are damaged or worn by excessive use."

Doctadisk comes with a free blank disk as well as the main program disk, and costs £15.95 from Mermaid, 27 Buckingham Gardens, Edgware, Middlesex, phone 01-951 0906. The next Mermaid release should be an educational program, due for late October.



Doctadisk — "invaluable"

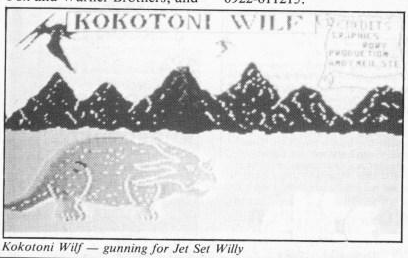
Elite on the street

NEW SOFTWARE company Elite have plans to dominate the Christmas market with two games releases based on US television series currently popular in the UK.

Elite's first release, the enigmatically-named Kokotoni Wilf, is a multi-screen arcade adventure in which the hero has to recover all the pieces of the missing Dragon Amulet. There are over 60 screens, and the program is being marketed as a rival to the popular Jet Set Willy.

Elite's forthcoming releases are licenced from 20th Century Fox and Warner Brothers, and are based on the TV series The Fall Guy and The Dukes of Hazzard. Elite spokesman Steve Wilcox said "We think American programmes are a better bet than British ones, since they seem to appeal to the same sort of people who play computer games. Although these titles have been licenced from America, the software is British. We're hoping that The Dukes of Hazzard will be the Christmas number one game."

Elite games for the 64 will cost £6.95 on cassette and £8.95 on disk. Contact Elite at 55 Bradford Street, Walsall, 0922-611215.



Kokotoni Wilf — gunning for Jet Set Willy

The Cheetah, the RAT and the Interpod

Interpod — saved by Cheetah Marketing

PARC ELECTRONICS, one of the UK's leading electronics sub-contractors, has taken over the sole marketing and manufacturing rights to Interpod, the intelligent interface for the 64 and Vic developed by Oxford Computer Systems.

OCS has recently experienced financial problems, and though the future of the compiler software for which the company is best known has not yet been decided, Interpod seems safe. Parc will be marketing the unit, which provides RS232 and IEEE interface facilities, through Cheetah Marketing, another recent acquisition. Price will be cut to £59.95.

Cheetah is best known for a range of software and hardware for the Spectrum computer, but CBM related products are in the pipeline. The first will be an infra-red cableless joystick, R.A.T., which is claimed to have notched up impressive pre-launch orders, with the launch set for the start of September.

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(Adventure Int) — disk

Diskey gives your Commodore 64 the file-handling capabilities a serious user needs. Many users have complained about the inability of the C64 DOS to copy SEQ or PRG files, or USR files of similar form, from disk to disk. Diskey gives you not only this, but also the ability to examine, copy, or modify any disk. You can now rescue data from a crashed disk, and recover killed files. Diskey comes complete with its own DOS. Single/double-disk use.

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A full selection of other word processing programs and matched utilities is available: EASYSCRIPT (disk) £60, EASYSPELL £20, EASYMAIL £20 etc.

MULTIPLAN
£95
(Microsoft/Hesware) — disk

Easy to use but very powerful spreadsheet. You can define cells by word labels rather than co-ordinates. Sorts columns or rows numerically or alphabetically. Very highly recommended. Serial printer output.

CALCRESULT
£95
(Handic) — disk

Has true 3D (multipaging) facility, and histogram features. Versions for Commodore and Epson printers. This is a very powerful and much liked spreadsheet. Very highly recommended. Single page version £47.50 (cartridge).

MICRO ASSEMBLER
£55
(Supersoft) — cartridge

Best of the lot. If you're into machine code — or working that way — this is the one to get or save your pennies for. Features 3-pass assembler, unlimited labels, source files can be linked, monitor, full screen editor, disk or tape operation. Plus AUTO, DELETE, FORMAT, FIND, NUMBER, DISASSEMBLE, OUT and TABLE. Monitor has standard TIM commands plus hunt, transfer and disassemble.

HS-64 ASSEMBLER
£55
(JCL Software) — cartridge

Combines the features of a powerful assembler with a number of toolkit programming features. An ideal program development aid, Includes AUTO line numbering, FIND string, CHANGE string, DELETE line range, TYPE to inspect or print a file without loading it into memory, GET source text files, PUT outputs source files to disk, DO executes first line, LIST source file, RENUMber lines, JOIN program files, SCROLL multiple viewing facility, CBM code selection, ASCII code selection, RBAS reset, SIZE of file and start/end load address, SETBRK and CLRBRK to insert and remove break points from program being tested in RAM, HD and DH to give number system conversions, BOOM for a complete cold start.

KOALAPAD
£80*
(Koala Tech Corp) — inc cartridge

Comes complete with KoalaPaint cartridge which permits all those fantastic graphics facilities — commands include zoom, copy, colour swap, draw, lines, rays. Save pictures on disk and call these up from BASIC to use in your own programs! Programmer's Guide (disk £13) is useful. Logo Design Master (disk £30), Spelling I (disk £30), Colouring Series I — Geometric Designs (£25) are some of the other support programs available but it's easy to write your own.

MICRO-SIMPLEX
£178
(Micro Simplex) — disk

If you're in business and need to maintain an accurate audit trail and VAT record, this is the program for you! Will save you literally hours of work. Fully recognised by the authorities. Suitable for schemes A to F. This is a specialist, very highly developed product from a software house who offer an excellent after-sales service to registered users. Demo available on deposit.

THE LAST ONE
£97.50
(DJ 'A1' Systems) — disk

Programming aid that frees you from the graft if you're thinking of writing specific applications. Creates stand-alone error-free coding in standard BASIC. Input is in the form of one-line descriptions defining, in plain English, the user's intention. This word 'flowchart' act as basis of computer's questioning session which leads. Programs you create can be for any application. Highly recommended.

CODEWRITER
£85
(Dynatech) — disks

Database design system like TLO. Easier to work with but marginally less powerful. Disk 1 features data entry generator, disk 2 carries report and menu generator. Very flexible.

SUPERBASE 64
£88.00
(Precision) — disk

Really excellent database generator, still at our special price. All things considered, we think this one's the best of its type and a must for all serious Commodore 64 users. Can be used for anything from mailing lists to stock control and invoicing. Lets you tailor the database to your exact requirements. Differs from program generators such as TLO and CodeWriter in that the systems menus and core program are always the same. But Superbase is not like the powerful for that — in fact it has database features and facilities beyond the needs of mere mortal folk! Now with STEPPING STONES program modules at £10 each including Job Costing/Estimating, Sales & Purchase Daybooks, Cashbook, Stock Records.

FLIGHT SIMULATOR II
£40*/£33
(Sublogic) — disk/tape

This is so good the authors think you can learn 'the ropes' as far as instrument control and flying are concerned. Accepting the limitations on the graphics side — nevertheless outstanding in terms of personal computers — the simulation is quite excellent. Expensive but it's the best one for the 64 by far . . .

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(Tronix) — disk

This is SOFTWARE AUTOMATIC MOUTH, a quite outstanding piece of software which gives your 64 limitless speech synthesis capability. Offers English text-to-speech or phonetic input, in direct or program modes. Full control over pitch, speed, inflexion. There really isn't anything like it, even on hardware!

BOOKS
There are some 60 or so books specifically about the Commodore 64. We have a full list (50p) with a description of each. Included in the list are many other books of interest to Commodore 64 users. We can supply any book at cover price plus 50p each towards P&P.

ANATOMY OF THE 1541
£14.95

Really excellent book for those keen to get inside their 1541 disk unit. Absolutely everything you need to know — includes ROM listings, descriptions of 1541 use, use of programs such as COPYALL.

COMMODORE 64 HOME COMPANION
£10.75

If you want more details of some of the better quality 'serious' USA software for the C64, this book is an invaluable source of reference.

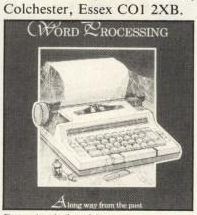
PRICES CORRECT AT TIME OF GOING TO PRESS. Let us quote you if you manage to find lower!! Items marked with an asterisk (*) are available at £5 less *while stocks last.*

Words for free

SOFTWARE Publisher Dataview Wordcraft Limited, producer of the Wordcraft 64 program, has produced a free eight-page brochure summarising the benefits of word processing.

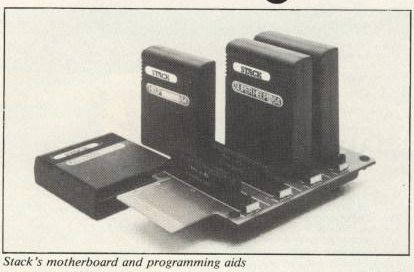
The full-colour booklet explains in straightforward terms some of the jargon associated with the subject, and deals with the ways in which wordprocessing can make or save money for small businesses.

For your copy, write to Amit Roy, Marketing Manager, Dataview Wordcraft Limited, Radix House, East Street, Colchester, Essex CO1 2XB.



Dataview's booklet

Stack cuts cartridges



Stack's motherboard and programming aids

COMMODORE software and hardware producer Stack Electronics has cut the price of its Programmers Aid cartridge for the 64. The series of cartridges provide utilities such as Basic extensions, fast tape operations, and two pass assemblers. The cartridges are recommended for use with Stack's four-slot motherboard.

Also newly announced is the Stack 100 series cassette-based compiler. Priced at £14.95 including VAT, it's intended to achieve more professional programming through speeding up Basic software.

Contact Stack at 290-298 Derby Road, Bootle, Liverpool, L20 8LN, phone 051-933 5511.

Cumana talks tape drives

DISK DRIVE manufacturers Cumana, previously best known for its Dragon micro peripherals, will launch a "floppy tape" drive for the Commodore 64 and Vic 20 in October.

Development engineer Carl Aldous described the system as being "similar to the Wafadrive system available for the Spectrum, but a totally independent design."

The floppy tape system works using loop microcassettes containing 16th inch tape. Various lengths of tape will be available on the microcassettes, with a 60 foot tape costing around £1 and having a 92K capacity.

Retail price should be about £100, with an option of connecting another drive at a lower price, as yet unspecified.

The onboard processor will allow the Cumana drive to be connected directly to the Commodore machines with no special interface.

Contact Cumana at Pines Trading Estate, Broad Street, Guildford, Surrey, GU3 3BH, 0483-503121.

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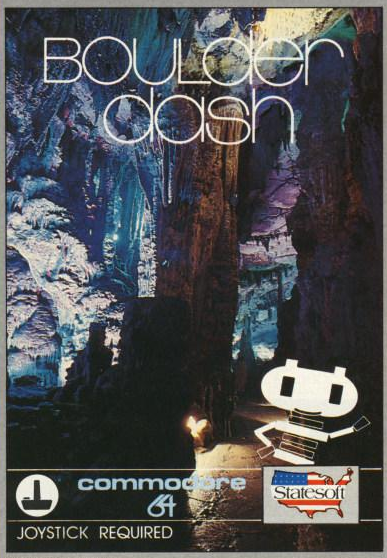

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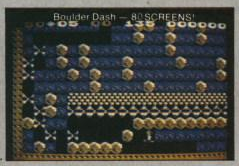
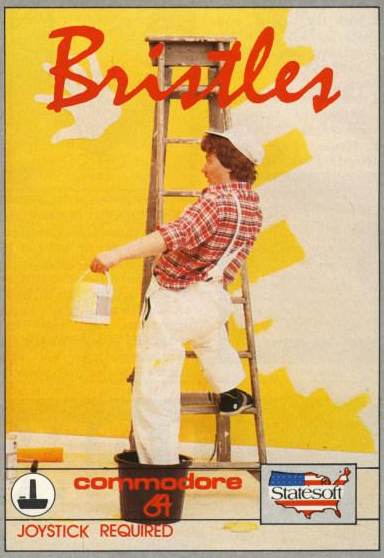
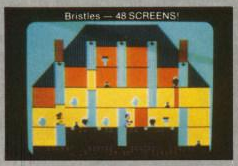


80 Screens





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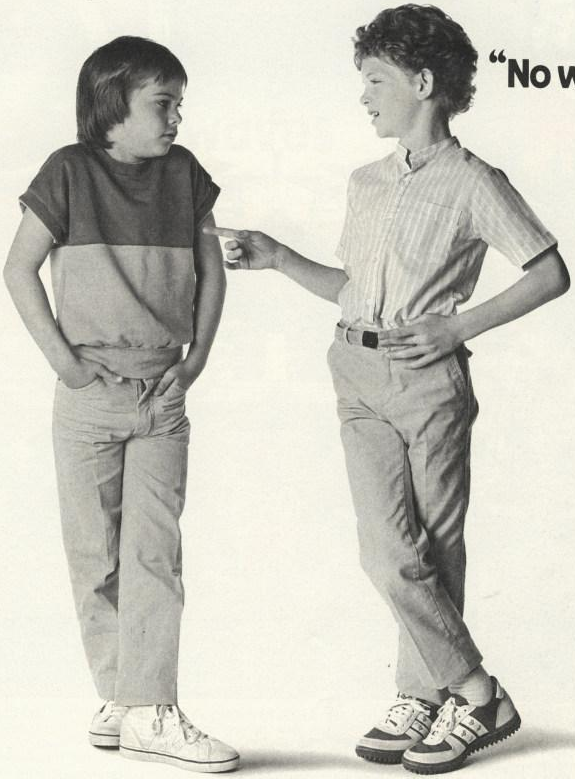

You know the feeling. A couple of plays and the best you can hope for from so much of the software around, is swapping it for something better.

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PROFILE

THE CHIP SHOP — sending software on the airwaves

*A new Radio 1 computer show and a revised Esperanto for micros — **Trevor Taylor** explains all to Chris Jenkins*

THE "BROADCASTING" of software — now a familiar concept due to the growth of networks such as Compunet and Micronet — is also possible in a much more direct form. Transmitting audio signals on ordinary radio wavebands is also possible, though Trevor Taylor met with some scepticism when he first mooted the idea.

"At the time I was working in BBC television, and it occured to me that if home computers record software on ordinary domestic cassettes, which are fairly grotty in quality, considering the quality of our broadcast chain is high we should be able to broadcast software. On **Tomorrow's World** we often reported on other people's innovations, and I thought it would be a good idea if we did some innovating ourselves."

Trevor's idea was to broadcast ten seconds of audio signal which viewers could record and load into their computers. "The producer wanted to keep down the amount of this horrendous noise, and decided that ten seconds was all an early evening audience waiting for Top of the Pops would tolerate — though there were those who thought it was better than some of the things Top of the Pops was putting out!"

Simulation

Though some experts had advised Trevor the system wouldn't work, and others thought it would, the only way to find out was to try it. Two ten-second programs, for the Apple and the ZX80, were to be transmitted, though everything did not go as planned. "The transmission, in December 1982, was live, and of course it wasn't possible to rehearse it. It didn't work in the studio, because we set up a simulation of the program the viewers should have picked up, but the presenter failed to wind the tape back to the start. As a result the studio demo didn't work, and we passed on to the next item. However, the broadcast transmission worked fine! Before the programme was off the air we started getting phone calls telling us that the program worked, and by the following Monday we had bagloads of mail, many of the letters including listings of the program. The system proved to be fairly robust; many people had just placed a microphone in front of the TV loudspeaker, following the instructions in the Radio Times."

The program, written by Trevor, required the viewer to type in his name, which then appeared along with those of the Tomorrow's World team in a scrolling credits display. It was a fairly simple start, and the big problem was that the programs had to be machine specific.

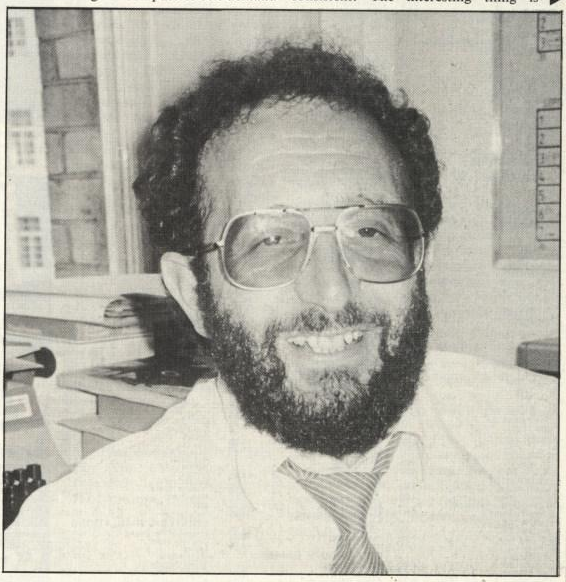
"I then discovered that the Dutch network NOS had been doing this for some time, and had been working on Basicode, a system by which you could run programs on a wide range of computers. The demand for more useful programs which had been generated by the **Tomorrow's World** transmission gave me the idea for **The Chip Shop**, combining the ideas of transmitting software regularly and looking at applications as well as hardware."

Hobbyscoop

Trevor travelled to Holland to talk to NOS, and found that the Dutch program **Hobbyscoop** had been transmitting software designed to appeal to electronics hobbyists. "They tended to be technical, and **The Chip Shop** wasn't going to be that sort of program. Basicode, the Esperanto of computers, was developed by an NOS technician, a Philips engineer and a programmer with the Dutch equivalent of the Open University. The first version of Basicode had a lot of problems, many of which were overcome with Basicode 2. We're now announcing the release of Basicode 2+ in September, upgrading Basicode 2 in two area; firstly in the number of machines it supports, and secondly in the look of it — there are now more on-screen prompts."

The Dutch Basicode always allowed for the Commodore computers, but not for the less popular Sinclair Spectrum. Basicode 2+ now covers the Commodore 64, the Vic 20 (plus 8K), and the 3000, 4000 and 8000 series machines, as well as many other popular micros including Acorn, Oric, Dragon, MSX and so on.

"We've also revised the manual, putting it through one technical editor so that it's consistent. The interesting thing is ▶



Trevor Taylor — "There should be much more computer coverage"

Computer & 64 the source

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◀ that part of the licensing deal with NOS is that we are required to produce Basicode at no profit. That's why the book and the cassette costs only £3.95, which is our production cost, and why it's sold through the Broadcasting Supoort Service, which is a non-profit making registered charity."

The first series of **The Chip Shop**, fronted by popular TV personality Barry Norman, took some of the NOS programs and tried to establish the sort of software radio listeners wanted.

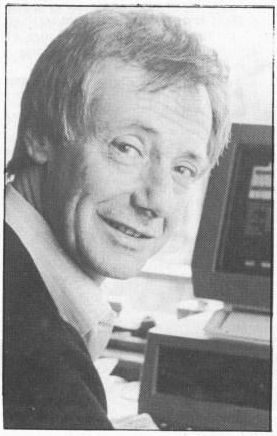
"The general reaction was that people weren't too interested in games — they wanted useful programs, though they didn't always tell us what they meant by 'useful'. For the new series we're aiming to broadcast programs which recognise the demand — they either perform some function which allows you to calculate something, or they're instructive in some way."

Trevor maintains that the aversion to games is not an indication that **The Chip Shop** misses the younger audience — "The last program we transmitted included a questionnaire, and from the replies we think the age range covered is very broad — young users to pensioners. Basicode is not very good at doing games anyway, since the graphics and sound capabilities have to be cut to the lowest common denominator."

Possible future plans include building up a subroutine library, putting out a program each issue which listeners can use as building blocks for larger programs.

Radio 1

One disadvantage of the first series of **The Chip Shop** was that the software had to be transmitted at a different time to the editorial content. "The software was transmitted at 23 minutes past midnight, four nights a week on Radio 4, principally because we couldn't broadcast for very long at peak times. It raised problems in that many younger listeners couldn't stay up that late to record the signals, so we're now partially overcoming the problem. The new series, starting in September, will have the software transmitted early in the morning, on Radio 1 starting on 30th September at 0555. The transmissions will be repeated the following Saturday at 0555. We think it's socially more acceptable to get up early rather than to stay up late."



Barry Norman — Radio 4 host

Independent

Even though listening figures for the last series are about 1 million, and with the addition of the Radio 1 slot for the new series this figure should double, the software transmissions can't palatably be transmitted at peak times. Even Radio 1 listeners to the new slot on Saturday mornings, at 7.33 to 7.45am, wouldn't stand for it! The new 12-minute slot in the Mark Page Show, presented by David Freeman, will give a few brief computer news stories and plug the Basicode transmission on the following day. The Radio 4 **Chip Shop** will still be presented by lovable Barry Norman, though Radio 4 will no longer be transmitting the software.

The Chip Shop suffers from the disadvantage of being a BBC programme which must demonstrate independence from the BBC computer. "It's a potential minefield for us to go on air and criticise a machine, because we'll be accused of favouritism towards the BBC. For that reason we did very little about hardware specifically in the first series."

Trevor tries to treat the BBC computer as being produced by an entirely separate company. "I think it's very important that the BBC's commercial interest in one machine should have no effect on the editorial content of **The Chip Shop**, and there's been no pressure put upon me to plug the BBC machine. It's up to me to convince the listeners of our independance."

Partly for this reason **The Chip Shop** tends to concentrate on applications rather than "kit". "As far as the Commodore machines are concerned, I don't feel there's any brief to wave a British flag — if the new machines are interesting we'll take a look at them, and if they're good we'll say so."

"We're also in a very different position to a computer magazine, because we have to appeal to an audience which has not necessarily switched on because they're interested in computers. Frankly the magazines are in a much better position to do reviews of new equipment than we are — they can devote several pages to it, with pictures, whereas I may only be able to give it two or three minutes."

Format

The new Basicode 2+ has been developed by **The Chip Shop**'s own software organiser with the extensive cooperation of the manufacturers of the machines involved. "We also sometimes contract outside programmers for particular jobs."

The new Radio 4 series features a letters spot, a revised format for news headlines, and thirty-second reports from Tokyo and California. "Aside from that we're sticking very much with the successful format. There are a couple of specials, the first of which is our second week on the air, the 22nd of September, when we're planning a very large outside broadcast from the PCW show in Olympia. We'll have a big stand there, and we'll be organising a number of events which will be recorded and edited for airplay. One feature is an All-Stars spot in which a panel of industry celebrities will be available to answer audience questions, with special features on small businesses,, journalists and so on. The other special we have planned is a live outside broadcast from Scotland — a sort of Silicon Glen report — and on the 3rd and 10th of November we hope to be live from Tokyo, though that's not yet confirmed."

The Chip Shop consists of Trevor, plus two production secretaries, a reporter, a researcher, a software organiser, a response clerk and the two presenters Barry Norman and David Freeman. The three offices in the BBC's Langham building — soon to be demolished to make way for a new broadcasting centre — are packed with computer equipment and stacks of software and press releases. With 120,000 letters generated by the last series, it's amazing that there isn't more time and resources devoted to computer programs.

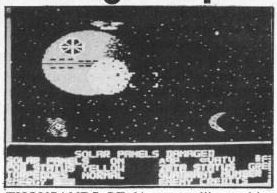
Response

"For the first two weeks of transmission we topped the response charts — people were clamouring for the Basicode kit. Basicode hadn't even been publicised, except on the program, through a couple of magazine articles and a feature on ITN. We couldn't afford to advertise Basicode through something like the **Radio Times**, due to the expense involved, but we're still looking at various ways of publicising it — we're keen for people to fill in order forms rather than just write in to us, since we're anxious that people know exactly what we're offering. All BBC premises will have order forms, and we're going to try to publish some sort of periodical — but weekly half-pages in the **Radio Times** would cost tens of thousands of pounds."

For the moment you should contact **Broadcasting Support Services, PO Box 7, London W3 6XJ**, for more details on Basicode. Each pack contains a manual explaining what Basicode 2+ is and what it can do, how to write Basicode programs, and how to load broadcast software. The cassette includes translation programs for all the machines covered — you just load up the one for your machine, and tune in to **The Chip Shop**.

Future plans may include Basicode 3, which may handle sound and graphics better — and a TV series? "I think there should be much more computer coverage — more radio programmes covering more specific subjects, or a TV series — but I don't feel there's space for Basicode transmissions on TV. Television would be a natural progression, and the broadcasting of software is only one part of what we're doing, and not necessarily the most important part — it's just the one which has caught people's imaginations."■

Mega-zap



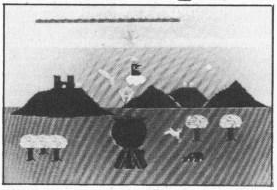
THOUSANDS OF 64 owners like nothing better than a "blimmin' good mega-zap" — so here's one. Zeta 7 from the very variable Mogul is claimed to be a version of an American arcade game, brought out as software before it hits the arcades. It's programmed by Mike Wacker of Fire Ant fame.

Forgetting the tedious details of solar-powered positron accelerators and Zeta-class defence spheres, what you're left with is a "through-the-window" scene of various effects. On-screen readouts indicate your pod's status as you fight off the baddies, which manifest themselves in waves of various numbes and shapes, including the good old Starship Enterprise.

There's not much more to say about Zeta 7 — it's very straightforward, with some good sound effects and excellent scrolling backgrounds. A good bet for alien-blasters.

Program: Zeta 7, 64
Supplier: Mogul, 90 Regent Street, London
Price: £7.95
Graphics: 7
Sonics: 5
Gameplay: 6

It's magic



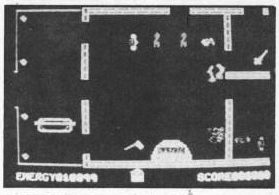
WYE VALLEY SOFTWARE'S **Merlin** owes something to Ultimate's Jet Pac, in that the object of the game is to fly around the screen picking up treasures and depositing them safely. There the similarity ends, in that Merlin depicts you as a cloud-riding wizard rather than a jet-powered spaceman. The forces of Evil set out to stop you, and to combat them you must fling magical lightning bolts and collect skulls, gems, frogs' legs and so on to pop in your pot. If a baddie manages to parachute into the pot then your brew is ruined. A good game, the only reservation being that each of the four screens is broadly similar. Still, well worth having.

Program: Merlin, 64
Supplier: Wye Valley Software, Parton House, Kinnersley, Herefordshire
Price: £6.90
Graphics: 7
Sonics: 6
Gameplay: 6

Soft *Hits*

The good, the bad and the ugly reviewed by our hard-playing team

Gothic, novel



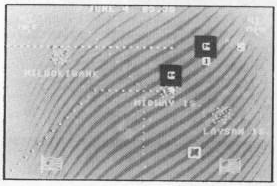
THE EVIL DEAD is the first release from film distributors Palace, and has received a lot of media attention due to its associations with the splatter movie of the same name. Fortunately the game itself is all good healthy fun, and though there aren't any great surprises it's the kind of thing which can keep you playing for hours.

An introductory blurb explains the scenario; a forest summer house viewed from above, in which you must protect your four friends and yourself from attack by the spirits of the Evil Dead. Various weapons can be picked up to help you in your fight, but beware! possessed humans split into four fearsome segments.

The battle to avoid dismemberment is fast and furious, and overall Evil Dead is an excellent debut from Palace Software. Great spooky Gothic music too.

Program: The Evil Dead, 64
Supplier: Palace Software, 275 Pentonville Rd, London
Price: £6.99
Graphics: 7
Sonics: 7
Gameplay: 8

Half and half



WITH STRATEGY and simulation games rapidly overhauling straight shoot-'em-ups in the popularity polls, it's no surprise to see that some of the best games now coming out combine elements of both forms.

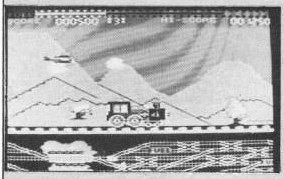
Catch **Battle of Midway** from PSS and you'll see a perfect example. The game is a simulation of the crucial WW2 USA/Japan air/sea engagement. The manual — which I've seen only in preliminary form — explains that although the game is not vastly complex, it needs some study. This is quite true. The main screen shows the deployment of various air and sea fleets, and you use your cursor to direct the movement of your US forces. Your task is to defend the island of Midway and sink Japanese aircraft carriers.

An air attack on the island is depicted with a marvellous arcade sequence in which tiny planes zoom through the air trying to avoid your tracer fire.

A short review like this cannot serve to give anything other than a brief idea of what promises to be an enthralling game.

Program: Battle of Midway, 64

Full steam ahead



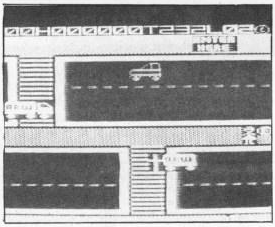
A TONY CROWTHER spectacular, **Loco** establishes itself immediately as a classic. The top section of the screen depicts an old-time locomotive chugging across a beautifully-detailed background, while the lower section gives a map of the rail layout. Using the joystick to select tracks, you must avoid explosive-laden trolleycars and attacks from aircraft and zeppelins. Smoke screens and steam blasters aid you, but you must make it to a refuelling depot before you grind to a halt and become a sitting target.

Wonderful music ripped-off from Jean-Michel Jarre, and attractive graphics (not astonishing, but well-designed), make Loco a winner. One of the rare cases where the box illustration doesn't give an erroneous idea of the game, and there are screen shots too.

Program: Loco, 64
Supplier: Alligata, 178 West Street, Sheffield
Price: £7.95, disk £11.95
Graphics: 9
Sonics: 9
Gameplay: 9

Supplier: PSS, 452 Stoney Stanton Road, Coventry
Price: £9.95 cass., £12.95 disk
Graphics: 7
Sonics: 6
Gameplay: 9

Psycho 8K

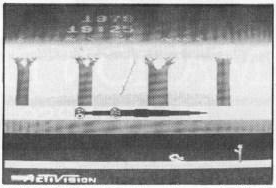


PRODUCING games for the 8K Vic is difficult. Producing good games for the 8K Vic is very difficult. Producing them at £1.99 must be near impossible. Mastertronic has done it with **Psycho Shopper.** Sorry if this sounds more like an advert than a review, but that's the way it goes sometimes . . .

As you'll see from the screen shot, the graphics are chunky but respectable, and there are four screens — although it's so hard to get across the busy road in screen one that I haven't got any further. Hazards include vicious Grannies, deadly traffic and runaway steamtrains, and pedestrian Arthur must collect gold coins on the way to the supermarket.

A goodie, and a clear improvement on Mastertronic's first batch of games. Let's hope there are more to come.
Program: Psycho Shopper, Vic + 8K
Supplier: Mastertronic, 48 George Street, Lodnon
Price: £1.99
Graphics: 8
Sonics: 5
Gameplay: 7

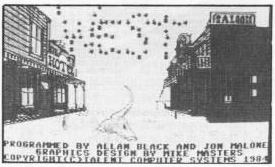
Take a fall



THE ORIGINAL and genuine, and still the best despite numerous imitations, **Pitfall** by Activision offers hours of play for the dedicated joystick basher. As Pitfall Harry you race through a seemingly never-ending jungle avoiding scorpions, tar pits, alligators, fires, swamps and quicksand, searching for treasure and trying to beat the 20 minute limit.

This one really is a classic, though its sets no new highs for graphics or sound. Strategy and timing is all, and there isn't a proton accelerating hyper-blaster in sight, thank goodness.
Program: Pitfall, 64
Supplier: Activision
Price: £9.99
Graphics: 6
Sonics: 5
Gameplay: 9

Go West

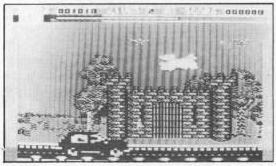


YET ANOTHER new company, Talent, and another interesting range of products. **West** is a text adventure with graphic interludes, set in 1884. You are on the track of a gang of robbers. The usual adventure conventions are adhered to, and the vocabulary seems to be good, around 200-300 words.

There are a few oddities — in gunfights, if you don't type "SHOOT" quickly enough, your life ain't worth a plugged nickel. There's also a section where you play pontoon with the robbers, and an odd feature by which if killed you return to the start, and will eventually find yourself standing over your own corpse!

Lovely graphics, drawn with Talent's Panorama system, but only the one scene. Had there been more West would have been even better.
Program: West, 64
Supplier: Talent, Curran Building, 101 St James Road, Glasgow
Price: TBA
Graphics: 9
Sonics: 5
Gameplay: 6

Pigeon pie



ANOTHER new company, Gremlin Graphics, has produced **Potty Pigeon.** Like Alligata's Loco it's by Tony Crowther, and like Loco it's fabby. Percy the pigeon flies through a smooth-scrolling landscape of motorways, computer shops and castles, picking up twigs to add to his nest. Cats, ferrets, kamikaze planes and twig-snatching sparrows serve to liven up the action, and Percy strikes back with revolting eggbombs. Nice zany music and nine levels of difficulty. Look out Jeff Minter, the pigeons are coming . . .
Program: Percy the Potty Pigeon, 64
Supplier: Gremlin Graphics, Alpha House, 10 Carver Street, Sheffield
Price: £7.95
Graphics: 9
Sonics: 9
Gameplay: 9

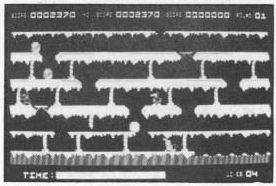
An up-and-under

PROVING once again that the state-of-the-art programs come from the good ol' U.S. of A., Statesoft's **Flip & Flop** hits a new high in perspective graphics programming. Statesoft is a new company which is licensing US games and adding a fast-loader and new packaging. The results should be excellent.

Flip & Flop is set in the Zoo of the future. You play two characters, Flip the Kangaroo and Mitch the monkey. As in various Q*Bert derivations, you have to jump from block to block until you've stepped on each section of the five zoo platforms. Then the game does an amazing flip-flop, and you find yourself as Mitch the monkey hanging underneath the platforms. Later stages involve flying nets and angry zoo-keepers.

Great music (Entry of the Gladiators), nice sound effects, go out and buy it.
Program: Flip & Flop, 64
Supplier: Statesoft, Business & Technology Centre, Bessemer Drive, Stevenage, Herts.
Price: £8.95, disk forthcoming at £10.95
Graphics: 9
Sonics: 9
Gameplay: 9

Ice scream



I'D HAVE THOUGHT that ladder-and-

Continued on page 21

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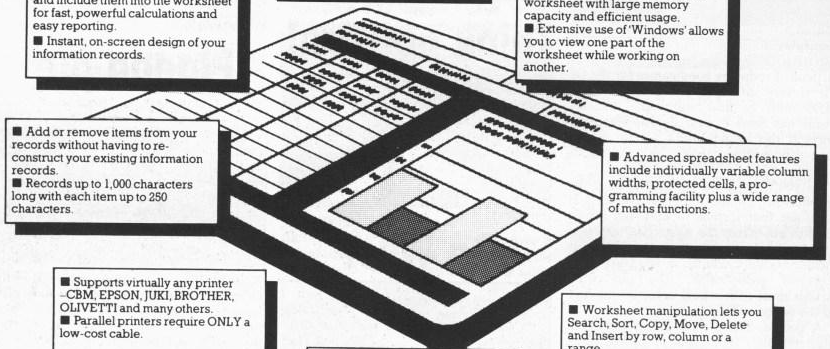

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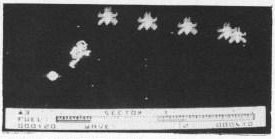
platform games would have had their day by now, but Anirog wishes to convince us otherwise with **Ice Hunter.** The scenario is unusual — how many other games can you name in which the hero is an Eskimo (answers on a postcard to Commodore Computing International)? The hero, Thorak, has to traverse the caverns in search of ice blocks, which have to be carried to the raft he has waiting. Dragons and mutated sealions try to stop him, but can be killed by dropping blocks on their heads or paralysing them with the help of a Power Pill. Many Anirog games are innovative — this doesn't happen to be one of them. It's a fair game for all that, and fans of this kind of program could do a lot worse.

Program: Ice Hunter, 64
Supplier: Anirog, 8 High Street, Horley, Surrey
Price: £6.95
Graphics: 5
Sonics: 5
Gameplay: 6

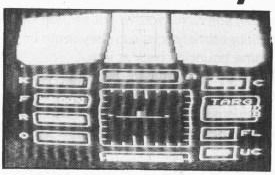
Space squaddie



WRITTEN BY Clifford Ramshaw of 64 Games Book fame, the Pavloda-powered **Star Trooper** is another mega-zapper, unrelated so far as I can discern to Heinlein's Starship Trooper. The best intro music yet (but wait for Ocean's offering next month), and nice if unremarkable graphics. Armed only with a jetpack and a laser you fly around incinerating aliens, and try to dock with a mothership to replenish your fuel. Not bad.

Program: Star Trooper, 64
Supplier: Melbourne House, Castle Yard House, Castle Yard, Richmond
Price: £5.95
Graphics: 6
Sonics: 6
Gameplay: 6

Bombs away

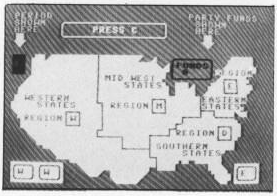


FOR THOSE of you who have asked (repeatedly) for a Flight Simulator for the 16K Vic, here it is. Bearing in mind the limitations of the machine, **Bomber Mission** is excellent — good colour, interesting screen display, plenty of options and a challenging game.

You pilot a WW2 heavy bomber, and must select a target and a weapon load before taking off. The joystick and function keys are used for steering and control of throttle and flaps. Attacks by enemy fighters, which can be shot down using your radar screen, can cause instant destruction or simply a fuel leak. As with all good flight simulators, after attacking the target and flying home you face the hardest part — landing!

Program: Bomber Mission, Vic + 16K
Supplier: Commodore
Price: £4.99
Graphics: 6
Sonics: 5
Gameplay: 8

Think political

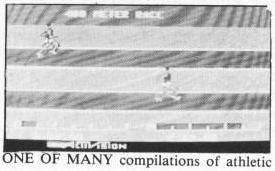


DISTRIBUTOR Amplicon has set up a division called Braingames, which intends to concentrate (pun) on thoughtful strategy games rather than on zapfests. First offerings include **Fame Quest** and **Election Trail,** which is a simulation of the American elections. The game, for one or two players, is menu-driven and features convining map displays. Fund-raising, opinion polls and hidden voting factors affect the outcome, and after 20 moves each side the votes are counted and the result declared.

Interesting to see a company dedicating itself to more intellectual games. Election Trail is a particularly good start if you have ambitions to be the next Ronald Reagan.

Program: Election Trail, 64
Supplier: Brain Games, Amplicon Group, Richmond Road, Brighton
Price: £7.95, disk £9.95
Graphics: 5
Sonics: 5
Gameplay: 6

On the run



ONE OF MANY compilations of athletic endeavours currently available for the 64 — including Database's **Micro Olympics** and Ocean's **Daley Thompson's Decathlon** — the Activision version of **Decathlon** is faced with stiff competition. Based on the arcade Track & Field, Decathlon features all ten events, including thee foot-races, hurdles, long and high jump, shot put, discus, javelin and pole vault.

Each event is represented in marvellous graphics with top-class animation. The only possible criticism is that the method of joystick control is very awkward — you have to waggle the stick back and forward to make your athlete move. Admittedly I can't think of a better method, and all the Olympic games have adopted it, but it's a pain.

Program: Decathlon, 64
Supplier: Activision
Price: £9.99
Graphics: 9
Sonics: 5
Gameplay: 6

For mutant camels

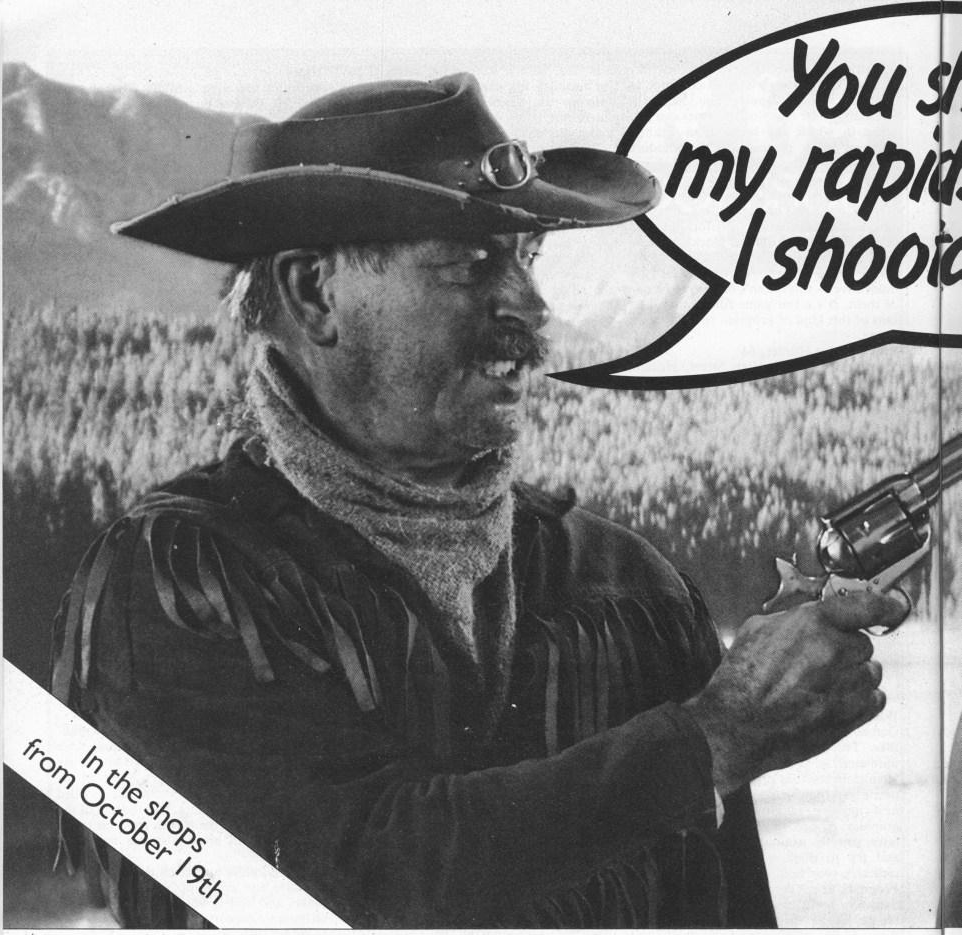
ANOTHER from Talent is **Kalah,** supposedly based on a traditional Arab game. It presents you with two sets of six 'pits', with a larger pit at each end of the two rows. Each of the 12 small pits is filled with a number of stones, and the aim of the game is to move the stones from pit to pit until you gain some abstruse numerical advantage.

Nice graphics and Bach music, but nice graphics and music do not a good game make, and Talent would be better advised to ignore Arabs offering them a good time in future.

Program: Kalah, 64
Supplier: Talent
Price: TBA
Graphics: 8
Sonics: 5
Gameplay: 4

MORE NEXT MONTH!

SOFTWARE COMPANIES — send your latest releases to SOFT HITS, Commodore Horizons, 12/13 Little Newport Street, London WC2R 3LD.



CLIFF HANGER

AUTHOR – JAMES DAY ORIGINAL MUSIC – BRIAN DOE

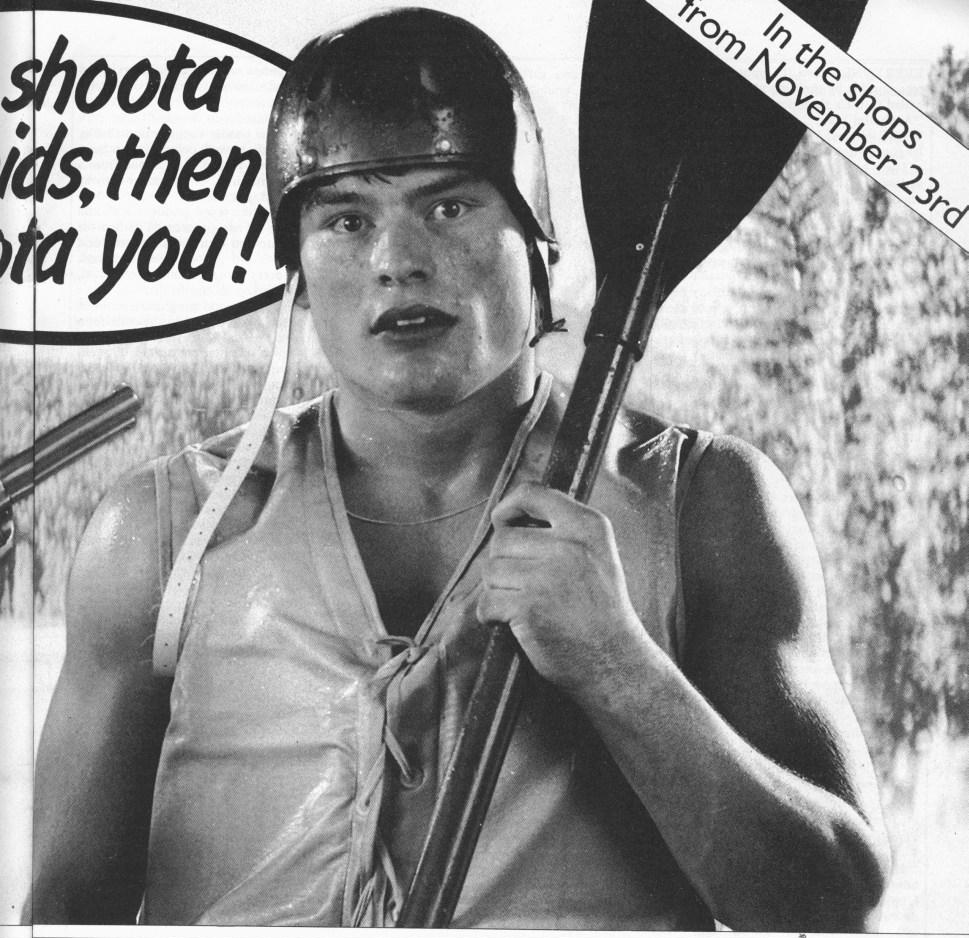
Thrill to the cartoon style action of Cliff Hanger, a really original, Wild West game. As Cliff the hero, you've got to stop the bandito shooting up the canyon. But with its own brand of wacky cartoon action fun, things simply aren't as they seem in Cliff Hanger. For a start, the boulder you throw at the ol' bandito may just come bouncing back at you.

Cliff Hanger incorporates all the elements that have made New Generation games best sellers for the Spectrum, such as original ideas, superb graphics and hilarious happenings – but now it's available first for the Commodore 64.

Featuring 50 separate screens, three levels of difficulty, one or two players scoring, Hall of fame and joystick compatibility or user defined keys, Cliff Hanger is set to be **THE** Commodore games playing sensation. Available from any good software store for just **£7.95.**

Selected titles of New Generation Software are available from your local computer store and larger branches of:

John Menzies WHSMITH Boots WOOLWORTH Spectrum



Shoot the Rapids

AUTHOR – PAUL BUNN

Ever wondered what it would be like to face the fierce white water in a top class canoeist slalom run? Well wonder no more because you can enjoy the fast action thrill of competitive canoeing from the comfort of your own armchair with Shoot the Rapids.

It's a game that involves real skill because you must move your joystick to simulate paddling action. You must get through the gates of the slalom course in the fastest time possible, while avoiding the river bank and rocks. There are also extra hazards like rogue speed boats and interfering beavers to worry about.

This multi level game features increasingly difficult river courses with superb graphics and smooth scrolling along the river. Qualifying times have to be reached to move onto the next course.

With Hall of Fame, one or two player scoring and joystick compatibility, Shoot the Rapids is probably the best sports action simulation game devised to date. Available from any good software store for just **£7.95.**

New Generation Software

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Tel: 0225 316924

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Software Protection

EVERYONE knows the pirates — they are easily recognisable by their wooden legs, deceased parrots nailed to their shoulders, and their language: "Aaah Jim lad. . . ." Oh, you mean SOFTWARE pirates! Well they speak a different language, don't they?

There has recently been a lot of talk and some action about software piracy. The talk has been about crooks who copy commercially marketed software. The action has involved a few court cases by established software houses.

I'm not going to set myself up as judge, for or against copying, but I will express my opinions in general.

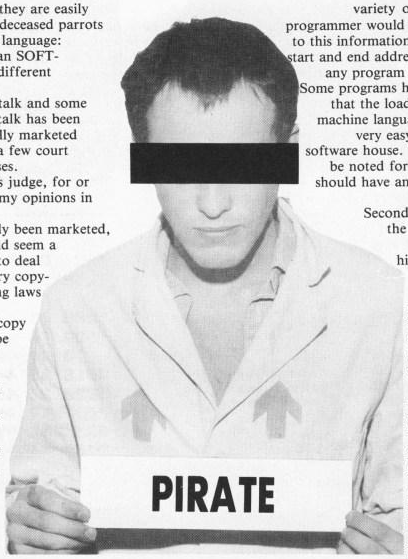
To copy software that has already been marketed, and re-market it in any form, would seem a clear case of theft. The law ought to deal with this area as it does with literary copyright. In fact there are some existing laws that try to cover this area.

To buy a piece of software and copy it for a friend or to put it from tape to disk is not so clearly a case of piracy.

The large game companies claim that they are losing millions every year from such copying. Of course if software companies start taking individuals to court, when they are only making a copy for 'Fred' down the road, it presents them with at least a large PR problem. How do they justify prosecuting their customers?

The only other avenue open to them is to protect their software. What's that? Did I hear several large software companies screaming, 'but we do'. In six years I have seen just two pieces of software which have been seriously protected, and at the last count I owned 700 items, all originals!

Of course people want to put their favourite games or utilities on disk, and good protection could allow that.



houses along with their copying services.

Whilst this might be a good idea and a good deal, you may well get a better deal in the long term by having each program individually protected to ensure that it will take anyone a good deal of time to break into or copy it.

A note here for readers and software houses — apart from the copiers already mentioned, there is the faithful audio copy. On most micros this is fairly easy, but the 64 is fairly fussy about the levels used, and whilst audio copying remains a possibility it is difficult.

There is a way of protecting against audio copying, but the general opinion is that the expense involved in doing this is too great.

The first thing anyone wishing to copy a program from tape will do is to try to load the first part and glean as much information as possible. For different reasons this is usually difficult. If a program will not load and be examined then the following command will give you the header information:

OPEN1<return>

In direct mode this will find the first header and stop the tape. At this point the name of the program and the start and end addresses are to be found in the tape buffer.

There may also be a program loaded in the header. At this point you do have a lot of information about the program and in a variety of ways could copy it. Any good programmer would not allow you the luxury of access to this information. It is very easy to have the wrong start and end address placed into the tape buffer with any program in the header virtually unreadable. Some programs have such weak protection on them that the loader may be got at by a load from a machine language monitor, which makes copying very easy and is careless on the part on the software house. There are a few points that should be noted for use on any program. The first file should have an auto-run with confusing start and end addresses.

Second, every program can be scrambled, the stop key should be disabled where possible, and programs should be hidden with checks in the code for a proper load.

Included here are a few limited programs to help you get the elements of protection and to encourage software houses to produce protection that will be uncrackable!

The first program is an auto-run — it is set up to save a Basic program with an auto-run on it. It is by no means foolproof and could be enhanced in many ways, but it does give the general idea. There is a disassembly of the code for you to study and a Basic loader to make things easy. The Basic loader should be entered and saved. On testing it checks will be made for correct entries. If all is well the program will give you the format for saving a program. The filename is optional.

In general, the program stores the start and end addresses of the program to be saved. Next, a piece of code is transferred to $02A5 hex onwards and the Basic pointers changed to enable it to be saved. The Basic pointers for the program in RAM are then restored, and another save is executed. When the program is loaded it will auto-run, disabling the stop key, loading and running the next program on tape.

As mentioned before, this is not an unbreakable auto-run, but it works! An addition to this might be to scramble the program to be saved and to unscramble it before execution; the extra code needed would look like this:

```
LDA # $00
STA $FB
LDA # $08
STA $FC
LO LDY # $00
L1 LDA ($FB),Y
EOR # $FF
STA ($FB),Y
INY
BNE L1
INC $FC
LDA $FC
CMP # $A0
BNE L0
RTS
```

This routine would scan and scramble the whole of normal RAM on the first pass (saving) and unscramble the same area on the second pass (loading). The main program could be hidden. If it is a Basic program then the start of RAM could be changed; using location 43 & 44, the screen could be moved.

Any cartridge that is plugged in to the 64 has its own code. Most of this is readable code and therefore can be copied. The complete cartridge can be copied on to a device of your choice, but this is not so simple.

However, portions of code or all of the code in a cartridge can be transferred to another part of memory and then saved. Of course all jumps and branches will need to be reset — this can be a huge job and will require some skill.

As mentioned earlier, programs can be hidden and scrambled to fool anyone trying to make sense of them. There are a number of ways of doing this and a number of steps that should be taken. The following routine could be used before saving the program with an auto-run, thus adding several layers of protection.

There is more than one way of hiding programs from prying eyes. If we stick to Basic programs the most obvious and easiest is to disable the LIST command; this can be done by altering the contents of the vector labelled IQPLOP at $0306 and $0307 hex. It can be simply disabled with the following:

POKE 775,200<press return>

This will disable the list command, but there are other possibilities. To return to normal enter:

POKE 775,167<press return>

Now enter the following in direct mode:

POKE 774,226:POKE 775,252<press return>

If you are foolish enough to try the list command now the 64 will reset.

Any of the vectors, OPEN, CLOSE, SAVE, LOAD etc can be treated in the same way. If they are not needed they can be disabled or pointed to another system. The best thing to do is to point them at a routine of your own. The one below deals with the run – stop and restore keys:

.C000 LDA # $0A (new low byte)
.C002 STA $0328 (place in stop vector)
.C005 LDA # $C0 (new high byte)
.C007 STA $0329
.C00A LDA # $91 (stop vector points here now)
.C00C RTS

The result of calling the above routine is to disable the run – stop and restore key, by pointing it to a routine at $C00A hex that simply disables the keys every time they are pressed. The above technique can be used on all vectors, even the interrupts, although that is a little more delicate.

However, back to hiding programs. The next technique, is to fiddle with the Basic line number pointers. This can only be easily done from a machine language monitor. The idea is to take the first pointer and change it to point at the last line in the Basic program. To illustrate this I have included a five line Basic program as a demo.

```
1 REM THIS IS HIGHLIGHTED
10 PRINT"FIRST LINE"
20 PRINT"SECOND LINE"
30 PRINT"THIRD LINE"
40 PRINT"FOURTH LINE"
```
Demo

First enter and save this small Basic program, then enter your monitor. If you don't have a monitor, it should be easy enough to get hold of a copy of Jim Butterfield's Supermon 64 from ICPUG. Enter the following command:

M 0800 0860

This should give you the display below.

The first pointer is at locations $0801 – $0802 hex. They should be changed so that the first line looks like this:

.:0800 00 65 08 01 00 8F 20 54

Having made the changes, exit the monitor and list the program. You should only see one line, which will be the first one. This technique can be used on any program, no matter where Basic RAM starts. Simply change the first pointer to look at the end of the Basic program. The end of a Basic program is locatable by using a monitor to search through until the 3 zeros are found.

```
10 POKE53280,6:POKE53281,7:PRINT"■"
20 COUNT=0
30 FOR ADDR=49152 TO 49368
40 READ NUM
50 COUNT=COUNT+NUM
60 POKE ADDR,NUM
70 NEXT ADDR
80 IF COUNT=25981 THEN100
90 PRINT"■  DATA ERROR SHOULD BE 25981
NOT ";COUNT:END
100 IF ADDR=49369 THEN120
110 PRINT"■  PROGRAM ERROR CHECK
LOOP":END
120 PRINT"■■  TO SAVE WITH AUTO-RUN
ENTER:"PRINT" ■■  SYS49152";
CHR$(34);"FILENAME";CHR$(34)
130 END
140 DATA 165,43,141,217,192,165,44
150 DATA 141,218,192,169,165,133,43
160 DATA 141,2,3,169,2,133,44
170 DATA 141,3,3,165,45,141,219
180 DATA 192,165,46,141,220,192,169
190 DATA 3,133,46,169,4,133,45
200 DATA 162,85,189,131,192,157,165
210 DATA 2,202,16,247,32,212,225
220 DATA 169,3,133,185,32,89,225
230 DATA 173,217,192,133,43,173,218
240 DATA 192,133,44,173,219,192,133
250 DATA 45,173,220,192,133,46,169
260 DATA 237,141,50,3,169,245,141
270 DATA 51,3,169,131,141,2,3
280 DATA 169,164,141,3,3,169,0
290 DATA 133,157,169,1,162,1,160
300 DATA 1,32,186,255,169,0,32
310 DATA 189,255,166,45,164,46,169
320 DATA 43,32,216,255,96,169,131
330 DATA 141,2,3,169,164,141,3
340 DATA 3,169,0,133,157,32,213
350 DATA 255,169,1,170,168,32,186
360 DATA 255,169,0,162,0,160,0
370 DATA 32,189,255,169,251,141,40
380 DATA 3,169,246,141,41,3,169
390 DATA 2,141,32,208,169,0,32
400 DATA 213,255,134,45,134,47,134
410 DATA 49,132,46,132,48,132,50
420 DATA 169,246,141,41,3,169,237
430 DATA 141,40,3,169,0,32,94
440 DATA 166,32,142,166,76,174,167
```
Basic loader

This indicates the end of the program. Using Supermon the following command should work:

H 0800 9FFF 00 00 00

Before we move on, it may be interesting to note that we can have control and colour codes work directly in our programs as one can with the BBC in mode 7. Again this can only be done by using a monitor.

For example, using our Basic demo program we can remove the REM in line one and highlight the line. To do this enter your monitor with the Basic program in memory, and change the 8F at location $0805 hex to 12 hex. The first line should then look like this:

.: 0800 00 1B 08 01 00 12 20 54

```
B*
   PC   SR AC XR YR SP
.;0008 30 00 00 00 F6
.
.:0800 00 1B 08 01 00 8F 20 54
.:0808 48 49 53 20 49 53 20 48
.:0810 49 47 48 4C 49 47 48 54
.:0818 45 44 00 2D 08 0A 00 99
.:0820 22 46 49 52 53 54 20 4C
.:0828 49 4E 45 22 00 40 08 14
.:0830 00 99 22 53 45 43 4F 4E
.:0838 44 20 4C 49 4E 45 22 00
.:0840 52 08 1E 00 99 22 54 48
.:0848 49 52 44 20 4C 49 4E 45
.:0850 22 00 65 08 28 00 99 22
.:0858 46 4F 55 52 54 48 20 4C
.:0860 49 4E 45 22 00 00 00 00
.
.
```
Demo code

Now exit the monitor and list the program. If you got it right, line 1 is highlighted. This is not possible from Basic, as the code for reverse on $12 hex needs to be inserted. Trying to do this from Basic will give the reverse symbol, or simply 'R' at the best.

Some of you may have already realised that it is possible to enter other codes in the same way. Here is one more for a start; enter the monitor and look at the program with:

M 0800 0860

Now change location $0805 to 1C, which will give you the following:

.: 0800 00 1B 08 01 00 1C 20 54

Exit the monitor and list the program. The

```
B*
   PC   SR AC XR YR SP
.;0008 30 00 00 00 F6
.
.:0800 00 0B 08 00 00 9E 32 30
.:0808 36 31 00 00 00 20 A5 02
.:0810 A9 93 20 D2 FF A9 52 8D
.:0818 78 02 A9 D5 8D 79 02 A9
.:0820 0D 8D 7A 02 A9 04 85 C6
.:0828 A9 6A 85 2B 78 A9 33 85
.:0830 01 A9 D0 85 FC A9 00 85
.:0838 FB A0 00 B1 FB 91 FB C8
.:0840 D0 F9 E6 FC A5 FC C9 E0
.:0848 D0 EF A9 37 85 01 58 A9
.:0850 C4 8D 88 02 A9 04 8D 00
.:0858 DD A9 15 8D 18 D0 20 44
.:0860 E5 A9 00 8D 6A 08 60 00
```
SYS Dump

mind boggles — a red listing. Have fun with this one, try any code that you fancy!

Finally, a machine code routine that points to a Basic program elsewhere in memory, so that when it is loaded and listed, only an SYS number is visible.

There is a disassembly listing and a memory dump included — the disassembly listing looks a little odd, but all will be revealed. This easiest way to enter this is by using the memory dump. To do this enter the following from your monitor:

M 0800 0860

This will display the necessary locations. Now enter the SYS dump from the previous page.

Having done this, save it off and then exit the monitor and list the program. If all is well you should be presented with the following:

0 SYS2061

A little explanation is needed here. Locations $0801 and 080B hex are set to the end of the program which is $080B hex. Location $0803 and $0804 are the first Basic line number (zero in this case). The $9E hex in location $0805 is the SYS instruction and locations $0806 to $0809 inclusive contain the Ascii codes for the call (2061).

```
0800 00          BRK
0801 0B          ???
0802 08          PHP
0803 00          BRK
0804 00          BRK
0805 9E          ???
0806 32          ???
0807 30 36       BMI $083F
0809 31 00       AND ($00),Y
080B 00          BRK
080C 00          BRK
080D 20 A5 02    JSR $02A5
0810 A9 93       LDA #$93
0812 20 D2 FF    JSR $FFD2
0815 A9 52       LDA #$52
0817 8D 78 02    STA $0278
081A A9 D5       LDA #$D5
081C 8D 79 02    STA $0279
081F A9 0D       LDA #$0D
0821 8D 7A 02    STA $027A
0824 A9 04       LDA #$04
0826 85 C6       STA $C6
0828 A9 6A       LDA #$6A
082A 85 2B       STA $2B
082C 78          SEI
082D A9 33       LDA #$33
082F 85 01       STA $01
0831 A9 D0       LDA #$D0
0833 85 FC       STA $FC
0835 A9 00       LDA #$00
0837 85 FB       STA $FB
0839 A0 00       LDY #$00
083B B1 FB       LDA ($FB),Y
083D 91 FB       STA ($FB),Y
083F C8          INY
0840 D0 F9       BNE $083B
0842 E6 FC       INC $FC
0844 A5 FC       LDA $FC
0846 C9 E0       CMP #$E0
0848 D0 EF       BNE $0839
084A A9 37       LDA #$37
084C 85 01       STA $01
084E 58          CLI
084F A9 C4       LDA #$C4
0851 8D 88 02    STA $0288
0854 A9 04       LDA #$04
0856 8D 00 DD    STA $DD00
0859 A9 15       LDA #$15
085B 8D 18 D0    STA $D018
085E 20 44 E5    JSR $E544
0861 A9 00       LDA #$00
0863 8D 6A 08    STA $086A
0866 60          RTS
```

SYS Display

When a RUN is performed it goes to location 2061 decimal, $080D hex. If you look at this address on the disassembly we can see what happens.

The first instruction at $080D hex branches to $02a5 hex where it should find the Scramble program.

Do not forget to enter and save this program; we will come back to it later. The next two instructions clear the screen, a RUN is placed in to the keyboard buffer for later use and the start of Basic is moved to start at $086A hex. The subroutine from $082C to $085B moves the screen to 50176 decimal and the screen is cleared again. Finally our new Basic area has the first location set to zero and the routine finishes.

At this point the RUN in the keyboard will be executed on the Basic program which should be at that location. The way to save or load a Basic program into the area this routine is set for is with the following from direct mode:

POKE 43,106:POKE44,1:POKE 2154,0<press return >

Whenever this routine is tagged onto the beginning of a Basic program the whole thing should be saved from the monitor, with:

S"filename",08,0801,nnnn

Where nnnn represents the end of the Basic program, remember the 3 zeros. It can then be reloaded as a normal Basic program and executed.

The routine from $02A5 to $02C0 hex is a two pass scrambler. Any Basic program that is going to be saved with the above routine should first be loaded into 2154 decimal and put through the scrambler. To do this load the routine at $02A5, load the Basic program and enter:

SYS 677<press return>

Now save off the program. As it is now scrambled it is unreadable, and will not RUN: the routine that scrambled it must be loaded into memory and called again before any attempt is made to RUN the program.

```
B*
   PC   SR AC XR YR SP
.;0008 30 00 00 00 F6
.
02A5 A9 08       LDA #$08
02A7 85 FC       STA $FC
02A9 A9 6B       LDA #$6B
02AB 85 FB       STA $FB
02AD A0 00       LDY #$00
02AF B1 FB       LDA ($FB),Y
02B1 49 FF       EOR #$FF
02B3 91 FB       STA ($FB),Y
02B5 C8          INY
02B6 D0 F7       BNE $02AF
02B8 E6 FC       INC $FC
02BA A5 FC       LDA $FC
02BC C9 A0       CMP #$A0
02BE D0 ED       BNE $02AD
02C0 60          RTS
```

Scramble

This should give you some good ideas about protecting programs, and may well keep you busy for a while adding your own routines. A final thought for now on protection; how would you stop someone from reading or loading your programs in any way at all, even with the OPEN1 instruction. That should keep you busy, although I can tell you that it is possible!

There is no ultimate protection method, and we have covered enough ground to start with, but have hardly touched on the subject. I hope the above gives the software houses some ideas or inspiration, as I wish them luck and do not support anyone wishing to make a profit on their backs.

Readers will, I hope, be keen to learn what is possible with their own programs, and may well come up with ideas to help the process of protection along.

Kevin Bergin

```
C000 A5 2B       LDA $2B
C002 8D D9 C0    STA $C0D9
C005 A5 2C       LDA $2C
C007 8D DA C0    STA $C0DA
C00A A9 A5       LDA #$A5
C00C 85 2B       STA $2B
C00E 8D 02 03    STA $0302
C011 A9 02       LDA #$02
C013 85 2C       STA $2C
C015 8D 03 03    STA $0303
C018 A5 2D       LDA $2D
C01A 8D DB C0    STA $C0DB
C01D A5 2E       LDA $2E
C01F 8D DC C0    STA $C0DC
C022 A9 03       LDA #$03
C024 85 2E       STA $2E
C026 A9 04       LDA #$04
C028 85 2D       STA $2D
C02A A2 55       LDX #$55
C02C BD 83 C0    LDA $C083,X
C02F 9D A5 02    STA $02A5,X
C032 CA          DEX
C033 10 F7       BPL $C02C
C035 20 D4 E1    JSR $E1D4
C038 A9 03       LDA #$03
C03A 85 B9       STA $B9
C03C 20 59 E1    JSR $E159
C03F AD D9 C0    LDA $C0D9
C042 85 2B       STA $2B
C044 AD DA C0    LDA $C0DA
C047 85 2C       STA $2C
C049 AD DB C0    LDA $C0DB
C04C 85 2D       STA $2D
C04E AD DC C0    LDA $C0DC
C051 85 2E       STA $2E
C053 A9 ED       LDA #$ED
```

```
C051 85 2E      STA $2E
C053 A9 ED      LDA ##ED
C055 8D 32 03   STA $0332
C058 A9 F5      LDA ##F5
C05A 8D 33 03   STA $0333
C05D A9 83      LDA ##83
C05F 8D 02 03   STA $0302
C062 A9 A4      LDA ##A4
C064 8D 03 03   STA $0303
C067 A9 00      LDA ##00
C069 85 9D      STA $9D
C06B A9 01      LDA ##01
C06D A2 01      LDX ##01
C06F A0 01      LDY ##01
C071 20 BA FF   JSR $FFBA
C074 A9 00      LDA ##00
C076 20 BD FF   JSR $FFBD
C079 A6 2D      LDX $2D
C07B A4 2E      LDY $2E
C07D A9 2B      LDA ##2B
C07F 20 D8 FF   JSR $FFD8
C082 60         RTS
C083 A9 83      LDA ##83
C085 8D 02 03   STA $0302
C088 A9 A4      LDA ##A4
C08A 8D 03 03   STA $0303
C08D A9 00      LDA ##00
C08F 85 9D      STA $9D
C091 20 D5 FF   JSR $FFD5

C094 A9 01      LDA ##01
C096 AA         TAX
C097 A8         TAY
C098 20 BA FF   JSR $FFBA
C09B A9 00      LDA ##00
C09D A2 00      LDX ##00
C09F A0 00      LDY ##00
C0A1 20 BD FF   JSR $FFBD
C0A4 A9 FB      LDA ##FB
C0A6 8D 28 03   STA $0328
C0A9 A9 F6      LDA ##F6
C0AB 8D 29 03   STA $0329
C0AE A9 02      LDA ##02
C0B0 8D 20 D0   STA $D020
C0B3 A9 00      LDA ##00
C0B5 20 D5 FF   JSR $FFD5
C0B8 86 2D      STX $2D
C0BA 86 2F      STX $2F
C0BC 86 31      STX $31
C0BE 84 2E      STY $2E
C0C0 84 30      STY $30
C0C2 84 32      STY $32
C0C4 A9 F6      LDA ##F6
C0C6 8D 29 03   STA $0329
C0C9 A9 ED      LDA ##ED
C0CB 8D 28 03   STA $0328
C0CE A9 00      LDA ##00
C0D0 20 5E A6   JSR $A65E
C0D3 20 8E A6   JSR $A68E
C0D6 4C AE A7   JMP $A7AE
```

Disassembly

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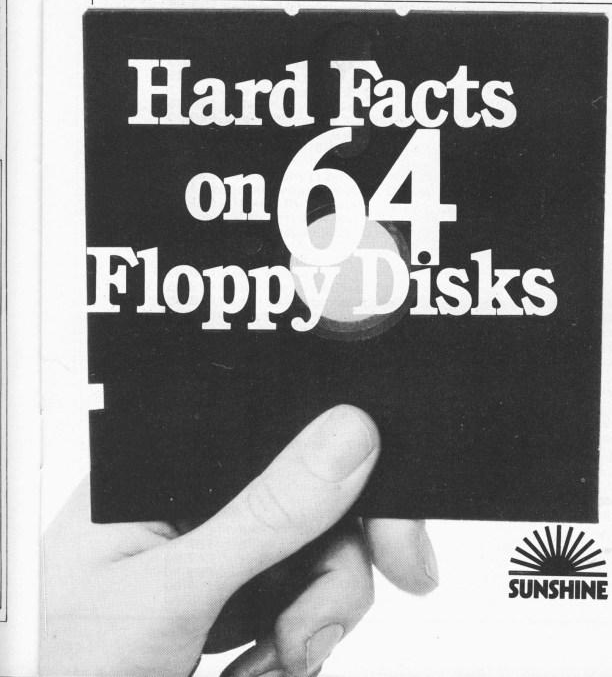

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Drawing on the 64's artistic abilities

***C P Whitcombe** looks at three graphics packages — two for budding painters, one for handling sprites*

NO DOUBT, dear reader (in common with most other 64 owners) you have a love/hate relationship with your electronic marvel. We all know that the 64 has excellent sound and graphics capabilities, but we are also painfully aware that it is not easy to get the best out of this machine. Fear not! Help is at hand with an ever increasing number of software packages designed to do away with some of the more long-winded procedures required by CBM Basic. Three such offerings are **Paint Pic**, from Kuma, **Panorama** from Talent, and Mirrorsoft's **Go Sprite.**

Paint Pic is a cassette based colour drawing program, which offers you a blank screen upon which you can let your artistic talents run wild using a crosshair cursor as a pen. There are 4 different coloured pens available at any one time, enabling you to draw in 3 colours (pen 0 is the background colour) at the touch of a button. Pen, border and crosshair colours can all be changed by single key operations. In 'pen' mode you are drawing points or lines of one dot width. In 'brush' mode this can be expanded to give thicker lines up to eight dots wide. Other commands available in this mode allow you to have 3 colours on the brush at the same time, which can be rotated along the brush length to give repeated colour patterns.

Help!

There are various 'standard' shapes which the program will draw for you, including Straight lines, Triangles, Circles, Ellipses and Arcs. All the closed shapes can be pen-filled by switching on the appropriate colour before pressing the required command key. In addition to 'pen' and 'brush', there is a text mode which permits the use of the 64 character set anywhere on the screen. If you have drawn something that you particularly like, you can duplicate it, either as it is, larger or smaller, the same way round or inverted.

Although it is possible to draw quite pretty pictures with Paint Pic it is rather slow and generally not very impressive. The HELP screens are poorly designed and, as such, are no HELP at all. The same applies to the manual. At £19.50, I find Paint Pic mediocre. Contact Kuma at Unit 12, Horseshoe Park, Horseshoe Road, Pangbourne, Berkshire, 07357-4335.

Panorama, on the other hand, is really rather good. Whilst the tape was loading I skipped through the manual and was pleased to see that it was well written and quite easy to follow.

The first screen presented is a menu of all the (1 or 2 key) commands along with their functions. (e.g. FC:Fill Colour). Hitting the SPACE bar will take you to the Picture Screen. Hit it again and it's back to the MENU.

At the bottom of the Picture Screen is a 'crib line' which gives the program status. e.g. current cursor position (x,y format), colour and texture selected and one or two other bits of useful information. If you want to use the bottom eight lines of the picture you can turn the 'crib' off.

To move the cursor about you use the cursor keys or (better still) a Joystick in Port 2. It travels at quite a steady pace at first, but things get fast and furious if you hold the stick over! Pressing the FIRE button will place a dot in the current position. You can erase a point by selecting the background colour and overtyping the error. To draw a trail of points, just hold down FIRE and keep going!

If you make a complete hash of things you can Wipe the whole screen before anyone notices. For those with something less than 20/20 vision, the area around the cursor can be magnified. Just the job for those important little places! As with most programs of this type, you don't have to worry about trying to draw 'perfect' circules, etc. All the 'regular' shapes are taken care of for you. Drawing an ellipse, for instance, only requires you to Mark the 2 Foci (?) and a point on the circumference. The rest is done for you.

On discovering some of your lines in the wrong place, worry ye not. Type Z and 'Hit' any part of the offending stripe with the cursor . . . it simply disappears. Nothing is complicated with Panorama. Even making pretty coloured patterns is easy, using the DT (Define Texture) command. A Texture (in this instance) is a block of 64 (8x8) pixels filled with dots in the pattern of your choosing. You can Define 22 of these blocks, labelled c to x. (A slight bug here displays them in the wrong order, but never mind).

Pixels

Select your Texture block whenever you wish and place anywhere on the screen. Shapes can also be Filled with these blocks in place of 'straight' colour. A set of BLOCK commands permit the transposition of any particular feature to a different point of the screen, either as an identical copy or as a mirror image (horizontal or vertical). To move a Block a small distance the Drag command is the one to use. To erase a Block use Block Erase (what else) which clears the marked section but leaves the rest of the screen intact. A Text command allows the use of any letters or numbers from the keyboard. You cannot use the Graphic symbols, although this does not present any problems as you can make your own Graphic characters using the Define Texture routine.

When you colour your picture ▶

Paint Pic — pretty pictures if you have the patience

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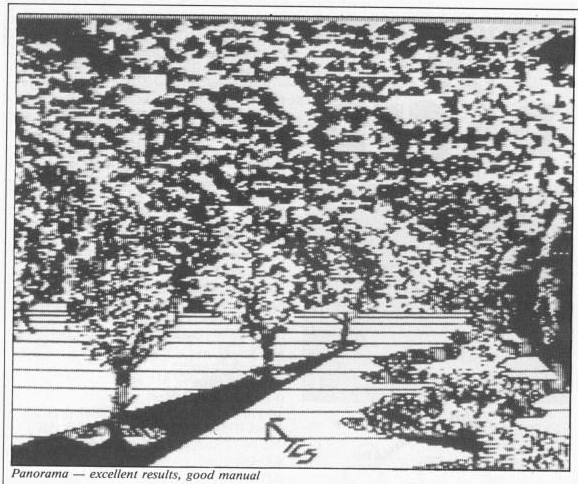


Panorama — excellent results, good manual

◀ you must remember that a Block of 64 Pixels can only have 2 colours; 1 foreground and 1 background. Each can, however, have any combination of all the available colours so there is plenty of scope for the more artistic amongst you. It is, perhaps, advisable to draw your original sketch on top of the checkerboard screen (colour scheme 0). This will show you where the sides of each colour block are so that you can get as many of your lines as possible to coincide with these edges. With a combination of good colour schemes, Define Texture, a little forethought and your own undoubted ability, excellent results can be obtained which you can store on Tape or Disk for later retrieval.

As you have, no doubt, gathered I liked this program a lot. It was fun! It's very easy to follow and even I managed to get the hang of it quite quickly. As I mentioned before, the manual is unusually good. Full Marks . . . almost. I didn't like the constantly flashing cursor, but then I've got to find something to moan about, haven't I? Price is £17.95 on tape or £19.95 on disk. Contact Talent at Curran Building, 101 St James Road, Glasgow, 041-552 2128.

Sprites

If you've ever tried programming the dreaded sprites into your 64, then you will know what a jolly task it is! Anything that promises to remove some of the drudgery involved has got to be worth a look.

Go-Sprite is a cassette program that enables the user to draw up to 32 sprites on the screen and try them out in any sequence. The first screen shown is the one on which you draw the object of your fantasy. This is made up of an enlarged grid (for designing on), a sprite display box (which shows what it really looks like . . . right size and colour) and a set of command ICONS. All that is required to enter an instruction is for you to place the cursor over the appropriate Icon and hit the 'fire' button. Along the bottom of the screen is a Paint Box; the colours being selected in the same way as commands.

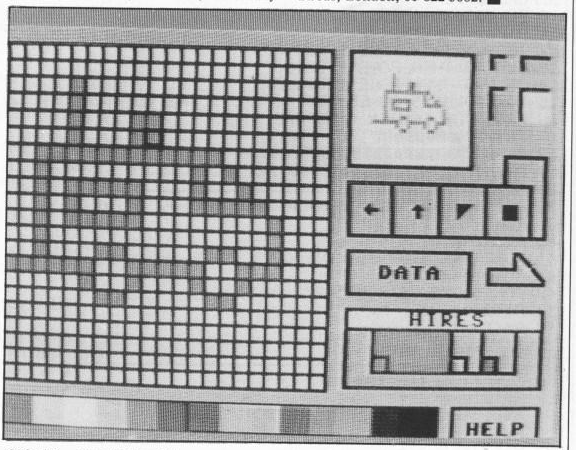
Each square on the large grid represents one dot of the sprite which will appear in blue when 'hit', or in white (background colour) when in Erase mode. When drawing in the Hi-res mode you are limited to 2 colours . . . 1 foreground, 1 background. In Multicolour mode there is the added attraction of 3 foreground and 1 background, but at a price. The definition is not as good because each vertical column is now 2 dots wide. On completion of the design, the sprite can be viewed back to front, upside down, stretched (horizontally or vertically), or in Negative forms. This reverses the foreground and background colours. You can, of course, clear the screen should you make a fool of yourself!

Once happy with your creation, you go to the next screen for sprite selection and copying. At the top is a 'Carousel' of 7 windows. Below is a Selector which allows you to scroll any of your 32 sprites into view, 7 at a time. Each of the sprites is assigned a position in the Priority Stack. This decides which will be in front of which if superimposed. The resulting overlay can be seen in the sprite Display Box. Whilst at this stage you can copy or erase any design.

Animation

Finally we arrive at the Animation Screen. This is when things really start to happen. There is a white strip running down one side . . . the 'film' Running across it is a version of the 'Carousel' from the previous screen. Sprites are transferred onto the Carousel as and when required in order to make up an animated sequence of up to 256 frames.

When the film is run the final result of your labours will be revealed in all its mobile splendour. Once you are satisfied that the sequence is correct you can prepare your sprites for use within your own programs. To do this you need to convert them into Basic data statements, using the CONVERT program so kindly supplied on the B side of the GO-SPRITE tape. (Although it is on cassette don't be put off; it uses Powerload, so takes under 3 minutes to become operational). All the screens have HELP boxes which refer you to a section in the manual. I especially like the use of Icons: it makes it all so much easier — and faster! Everything works. Not a bug in sight. This is the sort of standard all software packages should aim for. Excellent. Go Sprite costs £9.95 from Mirrorsoft, The Mirror Group, Holborn Circus, London, 01-822 3082. ■



GoSprite — not a bug in sight

STAR GAME

BMX RACER

by John Shay from

Solar Software

Solar Software evolved 18 months ago, with John Shay, who was then 13 years old, persuading his mother Brenda to buy him a Vic 20.

John had long been interested in electronics, and had dabbled about with a microtan 65, so Brenda knew he had the capability of producing a program. Amazingly, within 10 weeks of buying the computer Solar's first three games were on the market; **Galaxions, Scrambler** and **Super Breakout**.

By Christmas 1982 John had written three more programs, **Munch Man, Asteroyds** and **Gun Fight**.

By January '83 all six games were selling well, and Solar was receiving trade enquiries from computer dealers both in this country and abroad. The games were starting to appear on dealers shelves — but only in the Manchester area. It wasn't until Solar took part in a computer exhibition at the Midland Hotel in Manchester, when they were approached by a distribution company, that the games were available from computer shops all over the country.

During this time John had produced another two games, **Cavern Raider** and **Cosmic Fire Birds**, this bringing the total to eight games, all written in machine code.

By June 1983 the first 64 program was in the pipeline — **Galaxions**. This was followed by **Munch Man 64**, which brought a huge response.

Solar now has its own duplicating equipment, run by Brenda's husband, with the ability to produce 20,000 tapes per week.

Solar now has a total of 14 games for the Commodore machines, and two new programs are due at the end of September.

With new premises at 77 West Drive, Bury, Lancashire, Solar Software looks set for further success, and at 15 years John Shay is a director of a very successful company.

John's next 64 game for Solar is a multi-screen epic based on a Chinese legend. He says it will be the best yet, but while you're waiting you can type in BMX Racer.

The object of BMX Racer is to ride along the course, jumping cones and ramping over the flags at the end. The speed at which you are travelling affects the distance you jump, so it has to be judged carefully. You are allowed three attempts before the game finishes.

Hit an obstacle or fail to make the jump and you'll take a nasty fall! Use Z to slow down, X to speed up, / to jump.

Program notes

0-15 Set up variables
16-170 Set up and print scrolling ground
230-300 Test for jump and carry it out
310-400 Check if bike is at ramp
400-490 Crash routine
500-600 Reset variables and increment score
600-900 Sound routine
1000-1650 Introduction and data set up
2000-2560 Data for sprites, characters and scroll

Happy BMXing!

```
0 V=0:SC=0:LI=3:GOTO 980
1 K=1:A=PEEK(53279)
2 POKE251,0
4 POKE54277,0:POKE54278,0
5 POKE53280,0:POKE53281,0
6 POKE54296,15
7 F=208
8 Z=1
9 POKE252,2
10 POKE53272,(PEEK(53272)AND240)+10
11 A=PEEK(53279)
12 IF V=1 THEN POKE 16963,67
13 IF V=3 THEN POKE 16909,67
14 IF V=5 THEN POKE 16910,67
15 POKE53269,3:POKE53250,200:POKE53251,60:POKE2041,213
16 PRINT"■■ SCORE■   ■SPARE BIKES"
17 PRINT"■■■■■■■■";SC
18 PRINT"■■■■■■■■■■■■■■■■■■■■■■■■";LI
19 PRINT"■■■■■■■■■■■■■■■■■■■■SPEED ■■■■■"
20 A$="                                        "
30 PRINT"■■■■■■■■■■■■■■■■■■■■■■■■";A$;A$;"■■";A$;A$
35 REM
40 PRINT"■"
41 POKE 54278,00
42 POKE 54277,00
43 POKE54273,06:POKE54272,00
50 A$(0)="                                        "
60 A$(1)="                                        "
70 A$(2)="          -                 -           -   "
80 A$(3)="________________________________________"
90 REM**************
92 A$(0)=A$(0)+"                                        "
94 A$(1)=A$(1)+"                                        "
96 A$(2)=A$(2)+"                                        "
98 A$(3)=A$(3)+"________________________________________"
```

```
99 A$(0)=A$(0)+"                                        "
100 A$(1)=A$(1)+"                                       "
101 A$(2)=A$(2)+"                                       "
102 A$(3)=A$(3)+"_______________________________________"
104 REM--POKE-IN-SCENARY-DATA-
105 IF PEEK(2)=3 THEN 171
107 POKE2,3
110 FORA=0 TO 3
120 FOR B=1 TO LEN(A$(A))
122 C=ASC(MID$(A$(A),B,1))
123 D=1
125 IF C>206 AND C<212 THEN D=6
130 IF C=195 THEN D=2
132 IF C=199 THEN D=4
134 IF C=200 THEN D=3
135 IF C=201 THEN D=6
150 IF C>64 THEN C=C-128
160 POKE (4*4096)+(256*A)+(B-1)+1024,D
165 POKE (4*4096)+(256*A)+(B-1),C
166 NEXTB,A:PRINT"■□    PRESS RETURN TO START"
168 GETA$:IFA$<>CHR$(13) THEN 168
170 GOTO1
171 W=1024
172 FORA=0 TO 40:POKE16732+A,32:POKE16988+A,32:NEXTA
173 FORA=0 TO V*2 STEP 2
174 POKE16732+A,71:POKE16733+A,72:POKE16989+A,72
175 POKE16732+A+W,6:POKE16733+A+W,7:POKE16989+A+W,7:NEXT A
176 IFV=0 THEN POKE16909,32:POKE16910,32:POKE16963,32
177 FOR B=(V*2)+16 TO (V*2)+26 STEP 2
178 POKE16732+B,72:POKE16988+B,72
179 POKE16732+B+W,2:POKE16988+B+W,2:NEXTB
200 POKE53269,3:POKE53248,100:POKE53249,172:POKE2040,208
205 SYS18432
210 IF PEEK(251)<10 THEN A=PEEK(53279)
211 IF(PEEK(53279)AND1)=1 ANDPEEK(251)<110 THEN POKE2040,212:GOTO470
212 Z=Z-1:IF Z<>0 THEN 230
213 Z=4-INT(K/7):GOSUB 900
215 IF E=0 THEN POKE2040,F:E=1:GOTO230
220 IF E=1 THEN POKE2040,F+1:E=0
230 GETA$:IF N=1 THEN 360
231 POKE53250,200+K
232 IFPEEK(197)=12AND K>1 THEN K=K-1
233 IFPEEK(197)=23AND K<22 THEN K=K+1
234 IFPEEK(251)>150 THEN 360
239 IF PEEK(251)>120 THEN 250
240 IF PEEK(251)>100 THEN 250
245 IFA$="/" ANDH=0THEN H=1:I=0:J=0
250 IF G<>0 THEN G=G-1
260 IF G=4 THEN F=208:POKE2040,F
270 IF H<>1 THEN 297
275 IF I=0 THEN POKE53249,PEEK(53249)-3
280 IF I=1 THEN POKE53249,PEEK(53249)+3
290 J=J+1:IF J=4 THEN I=I+1:J=0
295 IF I=2 THEN H=0
297 IF PEEK(251)>115 THEN 310
300 GOTO 210
310 IFPEEK(251)>115 ANDPEEK(251)<118  THEN L=0:M=0:F=210:POKE2040,210
315 IF L>(K/2)THEN M=1:L=0:A=PEEK(53279)
317 IF M=1 THEN 340
320 POKE53249,PEEK(53249)-3:L=L+1
330 GOTO 210
340 IF PEEK(53249)=172 THENF=208:POKE2040,F:L=0:N=1: GOTO360
343 IF(PEEK(53279)AND 1)=1 THEN 470
345 POKE53249,PEEK(53249)+3:L=L+1
350 GOTO210
360 REM
365 REM
370 REM
```

Continued on page 37

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```
380 IF(PEEK(53279)AND1)=1THEN  400
390 O=1:GOTO450
400 F=212:POKE2040,F
450 REM
455 FORL=1 TO 50:NEXTL
460 SYS18704:GOTO500
470 REM---
475 POKE2040,212
478 IF PEEK(53249)>171 THEN 490
480 POKE53249,PEEK(53249)+2:FORL=1TO10:NEXTL:GOTO478
490 GOTO 450
500 IF O=0 THEN 550
505 PRINT"          * * WELL DONE ** *":SC=SC+1
506 IF V=6 THEN PRINT"          ";SC:PRINT"  ";:GOTO580
507 FORA=1TO1500:NEXTA
508 POKE828,SC:POKE829,LI:POKE830,V
509 CLR
510 SC=PEEK(828):LI=PEEK(829):V=PEEK(830):
520 V=V+1:PRINT" ":POKE2040,208:F=208:GOTO1
550 PRINT"     !  ! ! SMASH UP ! ! !":IF O=0 THEN GOSUB 800
551 FORA=1TO1500:NEXTA
552 POKE828,SC:POKE829,LI:POKE830,V
553 CLR
554 SC=PEEK(828):LI=PEEK(829):V=PEEK(830)
560 LI=LI-1
570 IF LI<>0 THEN PRINT" ":POKE2040,208:F=208:A=PEEK(53279):GOTO1
575 PRINT"          ";LI
580 PRINT"    GAME OVER.  PRESS RETURN TO REPLAY."
590 GETA$:IFA$<>CHR$(13)THEN 590
595 F=208:POKE2040,F:A=PEEK(53279):POKE53269,0:POKE53249,172
597 POKE53248,0:POKE53249,0:RUN
600 FORA=1TO300:NEXTA
610 POKE828,SC:POKE829,LI:POKE830,V
620 CLR
640 SC=PEEK(828):LI=PEEK(829):V=PEEK(830):RETURN
800 REM
810 POKE54276,0
820 POKE54278,12
830 POKE 54277,12
840 POKE 54276,129
850 POKE54273,50
860 POKE54276,128
870 RETURN
900 REM
934 POKE54276,32
940 POKE 54276,33
960 POKE54276,32
970 RETURN
980 REM
1000 IF PEEK(2)=3 THEN 1
1005 PRINT"          BMX RACER":POKE53280,0:POKE53281,0
1010 PRINT"          BY J.P.SHAY"
1020 PRINT"          PLEASE WAIT A MINUTE."
1030 GOSUB 1500:GOTO1
1500 REM--POKE--IN-DATA
1510 A(0)=(3*4096)+1024
1520 A(1)=(2.5*4096)+512
1530 A(2)=(4*4096)+2048:B=0:C=0
1550 RESTORE
1555 IF B=3 THEN 1600
1560 READ A:IF A=-1 THEN B=B+1:C=0:GOTO1555
1570 POKE A(B)+C,A
1580 C=C+1
1590 GOTO 1555
1600 POKE56334,PEEK(56334)AND254
1610 POKE1,PEEK(1)AND251
1620 FORA=0 TO 511:POKE(2.5*4096)+A,PEEK(A+53248):NEXTA
1630 POKE1,PEEK(1)OR4
```

Continued on page 39

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```
1640 POKE56334,PEEK(56334)OR1
1650 GOTO 50
2000 DATA0,0,0,0,0,0,0,0,0,0,0,0,0,224,0,0,192,0,0,224,0,0,160,0,1,85,32
2010 DATA0,170,96,1,83,192,0,224,128,0,224,64,0,112,64,8,255,192,31,51
2020 DATA64,59,22,240,111,249,216,97,145,72,51,25,152,30,0,240,0,0,0,0
2030 DATA0,0,0,0,0,0,0,0,0,0,224,0,0,192,0,0,224,0,0,160,0,1,85,32,0,170
2040 DATA96,1,83,192,0,224,128,0,224,64,0,224,64,8,255,192,31,115,64,59
2050 DATA126,240,111,201,216,97,229,72,51,1,152,30,0,240,0,0,0,0,0,0,0
2060 DATA0,0,0,0,0,0,7,0,0,6,0,0,7,16,0,5,72,0,10,8,0,5,116,0,10,138,0
2070 DATA5,14,0,3,245,0,0,197,192,7,123,96,30,98,32,55,179,96,101,129,192
2080 DATA97,128,0,51,0,0,30,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,7,0,0,6,0,0,7
2090 DATA16,0,5,72,0,10,8,0,5,116,0,10,138,0,5,14,0,3,245,0,0,221,192,7
2100 DATA207,96,30,106,32,55,131,96,101,129,192,97,128,0,51,0,0,30,0,0
2110 DATA0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,3,128,0,6,192,96,12
2120 DATA64,144,6,193,8,3,191,200,1,69,184,1,138,240,1,253,32,1,19,64,10
2130 DATA164,160,4,72,224,0,96,96,0,0,224,0,0,0,0,48,0,0,48,0,0,48,0,0
2140 DATA48,0,0,48,0,0,48,0,0,48,0,0,48,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
2150 DATA0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,-1
2200 DATA128,192,240,248,255,255,255,255,0,0,0,64,240,254,255,255,1,7,15
2210 DATA31,63,127,255,255,0,16,56,56,124,124,254,254,0,0,0,0,68,147,84
2220 DATA170,0,0,0,56,124,126,255,255,60,66,153,161,161,153,66,60,1,7,31
2230 DATA127,127,31,7,1,192,192,192,192,192,192,192,192,0,0,0,0,3,12,48
2240 DATA255,128,128,128,128,160,224,255,255,1,3,3,23,63,127,255,255,0
2250 DATA0,0,0,0,0,0,0,0,0,0,3,12,52,228,3,13,49,227,37,169,113,169,3
2260 DATA12,52,210,81,50,84,255,149,142,149,164,196,164,149,255,37,35,37
2270 DATA169,113,169,37,255,255,255,255,255,255,255,255,255,255,255,0,255,0
2280 DATA0,0,0,0,255,-1
2400 DATA76,4,72,0,120,169,255,141,3,72,169,72,141,21,3,169,61,141,20,3
2410 DATA169,3,141,154,72,169,0,141,13,220,141,13,221,169,1,141,26,208
2420 DATA173,17,208,41,127,141,17,208,173,22,208,41,240,141,22,208,169
2430 DATA8,141,153,72,88,96,173,25,208,41,1,240,80,141,25,208,173,3,72
2440 DATA73,255,141,3,72,240,17,169,0,141,33,208,173,22,208,41,240,141
2450 DATA22,208,169,81,208,16,169,0,141,33,208,173,22,208,13,153,72,141
2460 DATA22,208,169,250,141,18,208,173,17,208,41,127,141,17,208,206,154
2470 DATA72,208,15,165,252,141,154,72,206,153,72,173,153,72,201,255,240
2480 DATA20,76,188,254,76,49,234,2,0,5,2,2,239,2,0,2,160,0,0,239,0,169
2490 DATA7,141,153,72,162,0,189,89,6,157,88,6,189,89,218,157,88,218,232
2500 DATA224,160,208,239,166,251,189,0,64,141,127,6,189,0,65,141,167,6
2510 DATA189,0,66,141,207,6,189,0,67,141,247,6,234,189,0,68,141,127,218
2520 DATA189,0,69,141,167,218,189,0,70,141,207,218,189,0,71,141,167,218
2530 DATA230,251,162,0,169,32,157,88,6,24,138,105,40,170,224,160,173,22
2540 DATA208,22,208,9,7,141,22,208,76,129,234,0,255,0,120,169,49,141,20
2550 DATA3,169,234,141,21,3,169,0,141,26,208,88,96,255,255,255,255,255
2560 DATA255,255,-1
```

The WYSIWYG principle

Three business programs investigated by **Trevor Doherty** *— a word processor and two spreadsheets; And WYSIWYG explained*

A WORD PROCESSOR is often one of the first "serious" pieces of software in which personal computer owners invest. The Commodore 64 is one of the best home computers for word processing, due to the excellent keyboard and readily available printers and disk drives. A large number of 1541 disk drive owners were fortunate enough to get a free copy of Commodore's own **Easyscript** word processor with their drive — which no doubt in turn sold a lot of Commodore printers!

Because so many people already have Easyscript a software house selling a rival word processor must have an uphill struggle, with a large chunk of the market unlikely to buy their product, however good.

Perfection

Any word processor must have certain fundamental features. The most basic allow text to be typed in from the keyboard, viewed on the screen, edited and amended as required, printed out and then stored for later retrieval. The ability to perform these, plus additional features that most of the better processors allow, means that even a two fingered typist can produce a perfect printed output.

Wordcraft 64 (£49.95, disk) is the latest version of a word processor with a long pedigree on Commodore machines. The program comes with a "dongle" protection device which plugs in to joystick port two. There is a 60 page manual and a little card which fits round the 64's function keys and shows their use — an idea which shows the careful thought which has gone into the product.

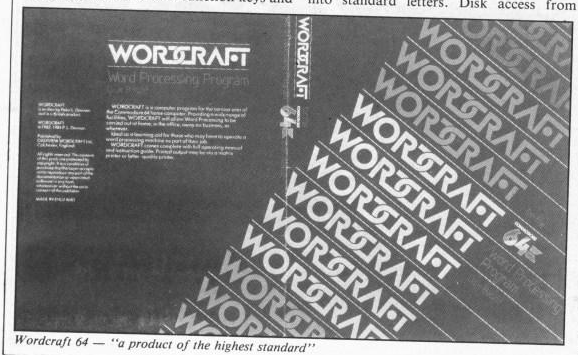
On loading the program you are confronted with a lurid multi-coloured screen (fortunately I quickly learned to change the colours to something more restful). Wordcraft works on the WYSIWYG principle — What You See Is What You Get.

Wordprocessors fall into two categories, those which format on output to the printer and those which format as you type; Wordcraft falls into the latter category. You type on the screen the way you expect it to appear in the printed output. I'm afraid that I'm not convinced that this method is actually successful on the 40 column screen available on the 64 — the screen scrolls sideways to allow a typical 80 column document to be input and you have to scroll from side to side to read the finished document on the screen. One advantage of this method is the text isn't littered with embedded format commands.

Wordcraft uses a "ruler", a coloured bar across the screen on which you set margins and tabs. This feature is very easy to use. Other features include search and replace — for example, you ask the processor to find every occurrence of the word "bush" and replace it with "tree". The ability to take text from one document and combine it with another is provided with the "merge" facility, and a "fill file" allows names and addresses to be inserted into standard letters. Disk access from within the processor is very easy, and text files can be loaded by calling up the directory and using the cursor to highlight the correct file to be loaded — no need to remember the exact name.

The ability to output text to a wide range of printers is one of Wordcraft's strongest features. Each printer supported has a printer definition file on the disk, covering a good range of the most popular printers. My MPS 801 worked fine. The clever thing is that if you have an unusual printer you can define your own printer definition file and save it on the disk; nearly half the manual is devoted to this useful feature.

Conclusions? A product of the highest standard, particularly strong on printer support, good value for money. But I'm afraid I couldn't get on with the sideways scrolling on the screen of a document wider than 40 columns.



Wordcraft 64 — "a product of the highest standard"

Formatting

A spreadsheet is another piece of software likely to be high on the list of non-games software purchases. A spreadsheet allows the computer screen to be used as a large sheet of paper ruled into rows and columns, by formatting the screen into a series of "cells" referenced A1, B1 etc. Rather like playing Battleships!

Virtually any task that can be done with a calculator and pencil can be carried out and subsequently saved for future use or printed. Once a sheet of calculations has been set up, it is then easy to amend individual figures and see the effect on the other dependent figures. Thus if you had a sheet showing your household budget you could see the effect of, say, a higher mortgage repayment on your finances. This feature is called "what if" calculation.

One feature which most spreadsheets offer is "replicate", the ability to copy a cell or range of cells so that similar calculations can be carried out elsewhere on the sheet. This allows, for example, similar totalling to be carried out in each of twelve monthly columns by just defining the calculation in the first month and then replicating it. I use a spreadsheet at home to carry out many tasks, such as keeping track of my bank account.

Autocalc 64 (£19.95 disk, £14.95 tape) is a recent entrant to the market. It is advertised as "100% machine code" which should give it a speed advantage over its rivals which are part or all written in Basic. In practice I found the speed advantage was slight and negated by other disadvantages.

Command

After loading Autocalc you define the size of the blank sheet, and the screen displays the familiar spreadsheet format of rows and columns plus a command line. the first time I tried to use it I tried to type in some headings but found I couldn't get anything to appear on the screen; a closer examination of the 5 page leaflet provided (which gives details of each of the 19 function commands)showed me that to enter text you have to press 'f1' 't' and then press the Return key before you can type a heading or label into a single cell. The same

thing applies with 'd' for data and 'f' for formula. This seems to me a tedious arrangement, and I found the extra three key-strokes per cell slowed down use. Other spreadsheets are able to distinguish between labels data and formula input by the initial key-strokes.

Limitation

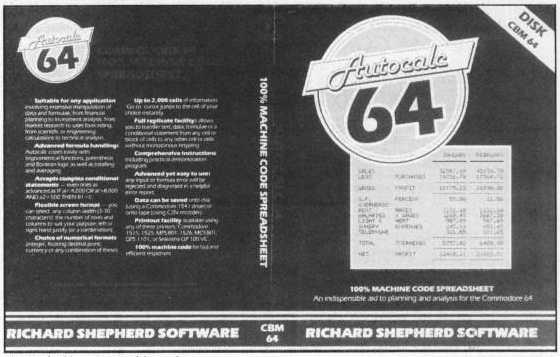
Autocalc also irritatingly blanks the screen during each calculation, a limitation other spreadsheets avoid. Calculation can be on request by using the command 'c' or automatic calculation can be selected, but this strangely takes place when you perform a *subsequent* operation, not immediately following entry of the number in question.

Two features I did like very much were the ability to change the width of individual columns, and the 'home' key which takes you back to cell A1 from anywhere on the sheet. No facilities are offered to insert extra columns / rows, delete them or move about. It is possible, however, to delete the contents of an individual cell. A limited replicate function is available allowing single cells, rows, columns or blocks of cells to be copied, but not expanded. Thus you cannot easily carry out similar calculations in each of several columns without entering them all individually.

Each time you type something in and press 'return' the cursor jumps in a direction dictated by its previous movement; unusual and annoying. Much more serious was that I managed to 'crash' the program twice. The first was caused by the 'command line' at the bottom of the screen not being protected. I inadvertently used the cursor key and typed in the wrong place on the screen. When I pressed 'return' the program crashed. The second occasion was when I incorrectly tried to save a file to tape instead of disk.

To sum up I'm afraid I cannot recommend this product, despite the competitive price. There are better spreadsheets for the money, for instance Supersoft's **Basicalc**.

PS (£69.95, disk) is a spreadsheet with a difference. What sets it apart from others



Autocalc 64 — competitive price

available for the 64 is a facility which lets you add functions by programming your own, in Basic, saving them on disk and recalling them from within the spreadsheet. This powerful facility means that the spreadsheet can be customised to carry out specialised calculations beyond the ability of a normal spreadsheet.

PS is based on **Practicalc** and offers the same facilities, with the addition of the programmable function. PS comes with a 125 page manual divided equally between the standard Practicalc features and the additional PS features.

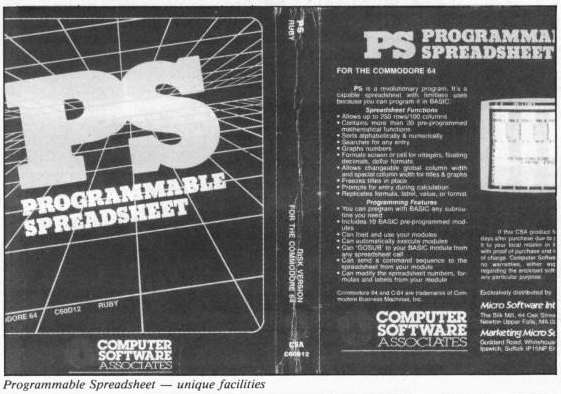
Formula

After loading PS you select your sheet size, up to a maximum of 2000 cells. You may choose the column width, and one column may be a different width from the rest, to allow long titles. Labels, data and formula may be typed straight in and PS can usually decide which are which. One drawback is that the screen display is just in upper case. Calculation is performed on request only by pressing '!'. Replication is easy using the f3 key, but only allows a single source cell to be used at a time, although this may be expanded into a range of target cells. Insert, delete and move facilities are all provided.

PS has some unusual facilities which are not often seen in 64 spreadsheets. You can change the representation of numbers to graphical format, and use Hi-res to plot bar graphs which look very good printed or on the screen. PS allows you to sort both alphabetically and numerically and to search for a number, word or formula. Titles can be fixed so that they do not scroll off when moving round the screen. All the above features are shared with Practicalc.

The unique PS programmable facility is covered in the second part of the manual; twelve additional facilities are described and included on the disk to get you started. Examples include a facility to carry out a sort in primary and secondary order and a feature to erase all the data from your sheet whilst leaving the titles intact. Program listings are given in the manual so you can see how it's done. The possibilities are limitless. To use the programmable facility you first recall your program from disk and then execute it as often as you like at the relevant places on your spreadsheet. Only one add on module may be used at a time, but several could be called, one after another from within the same spreadsheet.

I think PS is an exellent product, but the market for it is limited to those who need more than a good ordinary spreadsheet can provide. If you don't need the add ons, Practicalc, which is about £25 cheaper would seem a good bet. ■



Programmable Spreadsheet — unique facilities

Contact addresses:
Wordcraft 64; Dataview Wordcraft Ltd, Radix House, East Street, Colchester, Essex, 0206-869414
Richard Shepherd Software, 23-25 Elmshott Lane, Cippenham, Slough, Berks, 06286-63531
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Write in for a full descriptive catalogue (with details of cassettes).

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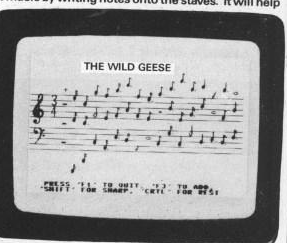

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COMMODORE SOFTWARE FILE

Split screen

R Baillon of Stapleford sends this 64 program

THIS IS A Basic loader program which creates a split screen. The Hi-res window area is variable, by POKEing 50439 with the start coordinate and 50410 with the end coordinate of the window area required. SYS50339 calls the routine and SYS50446 turns it off. The program uses hardware interrupts and raster values to change the graphics mode of the screen at desired points. It would be ideal for creating a split screen such as those used in adventure games, with text in the lower half of the screen and hi-res graphics in the upper half.

Other applications are limited only by your imagination!

```
 10 A=50339:T=0:C=0
 20 READD:IFD=-1THEN40
 25 POKEA,D:T=T+D:A=A+1:C=C+1
 30 GOTO20
 40 IFT<>16789THENPRINTCHR$(147):PRINT" DATA VALUE ERROR":END
 42 IFA<>50483THENPRINTCHR$(147):PRINT" NUMBER OF DATA ITEMS ERROR":END
 50 PRINTCHR$(147):PRINT" USE SYS(50339) TO CALL HIRES WINDOW"
 52 PRINTCHR$(17);PRINT"      SYS(50446) TURNS OFF WINDOW"
 54 PRINTCHR$(17);CHR$(17);CHR$(18);" TO CHANGE AREA OF HIRES WINDOW"
 56 PRINTCHR$(17);" USE POKE50439,Y FOR START OF WINDOW"
 58 PRINTCHR$(17);"      POKE50410,Y1 FOR END OF WINDOW"
 60 PRINTCHR$(17);" HIRES WINDOW AT 8192 TO 16191 IN MEM"
 65 PRINTCHR$(17);" USE NORMAL CLEAR HIRES AREA ROUTINE"
 67 PRINTCHR$(17);" IE. FORX=8192 TO 16191:POKEX,0:NEXT"
 70 PRINTCHR$(17);" ADJUST COLOUR MEM FROM 1024 TO 2023 TO"
 72 PRINTCHR$(17);" SUIT AREA RESERVED FOR HIRES WINDOW"
 80 END
100 DATA120,169,197,141,20,3,169,196,141
101 DATA21,3,173,17,208,41,127,141,17
102 DATA208,169,151,141,18,208,173,26
103 DATA208,9,1,141,26,208,88,96,169,1
104 DATA44,25,208,208,3,76,49,234,173
105 DATA17,208,201,27,240,3,76,249,196
106 DATA173,17,208,9,32,141,17,208,173
107 DATA24,208,9,8,141,24,208,169,151,141
108 DATA18,208,169,1,141,25,208,104
109 DATA168,104,170,104,64,173,17,208,41
110 DATA223,141,17,208,169,21,141,24,208
111 DATA169,0,141,18,208,76,238,196
112 DATA120,169,49,141,20,3,169,234,141
113 DATA21,3,173,17,208,41,223,141,17
114 DATA208,173,24,208,41,247,141,24
115 DATA208,173,26,208,41,254,141,26,208
116 DATA88,96,-1
```

Ski slope

This game for the unexpanded Vic 20 comes from Niall Murphy of Westport

THE OBJECT of Ski-Slope is to avoid the trees for as long as possible while collecting hearts and diamonds. If you take a jump you get extra points, but to do this you must be going at least at medium speed. You get a bonus life after 3000 points, and the game changes after three minutes.

Use the cursor keys to move left and right, and control your speed with X for slow, Z for medium and C for top speed. Break a leg!

```
5 PRINT"■■■■      SKI-SLOPE                ■ BY NIALL"
10 PRINT"■■■■ USE CURSOR KEYS FOR   MOVEMENT LEFT AND      RIGHT."
15 PRINT"■ X=SLOW SPEED(STARTING SPEED)."
20 PRINT"■ Z=MEDIUM SPEED."
30 PRINT"■ C=TOP SPEED."
```

Continued on page 44

```
32 PRINT"■ PRESS A KEY."
35 GET I$:IFI$=""THEN35
40 SC=0:DM=0:HT=0:JP=0:LI=3:TI$="000000":LJ=1:LK=1:POKE657,128
50 L=7910:Q=20
55 POKE 36878,6:POKE 36877,128
60 PRINT"■"
70 PRINT"■■■■■■■■■■■■■■■■■■■■■■"
75 PRINT"■■■■■■■■■■■■■■■■■■■■■■"
90 GOSUB 1000
95 IFPEEK(L)=88 THEN 300
96 IFPEEK(L)=90 THEN SC=SC+10:S=1:DM=DM+1:IF Q=5THENSC=SC+10
97 IFPEEK(L)=83 THEN SC=SC+20:S=1:HT=HT+1:IF Q=5THENSC=SC+20
98 IFPEEK(L)=102THEN GOTO 3500
100 POKEL,8:POKEL+30720,0: POKE L2,32
102 IF S=1 THEN S=0:GOSUB 3100
105 L2=L-22
110 FORPA=1TOQ:A=PEEK(197):NEXT
120 IF A=31THEN L=L-1:GOTO 140
130 IF A=23 THEN L=L+1:GOTO 140
132 IF A=33THEN Q=10
133 IF A=26 THEN Q=15
134 IF A=34 THEN Q=1
139 IF RND(1)<.05 THEN GOSUB 2500
140 IFL=7900THENL=7901
150 IFL=7921THENL=7920
160 SC=SC+1:IF Q<11THEN SC=SC+1
170 IF Q=1 THEN SC=SC+1
174 IFLK=1ANDVAL(TI$)>400THENSC=SC+500:LK=0
176 IF LJ=1AND SC>3000 THEN LJ=0:LI=LI+1
180 GOTO 90
300 POKE L1,42:POKE L2,42
305 POKE 36877,0
310 FORPA=1TO600:NEXT
320 LI=LI-1:IFLI<=0THEN400
330 GOTO 50
400 PRINT"  SCORE=";SC
401 PRINT"■   ♠=";DM
402 PRINT"■   ♥=";HT
403 PRINT"■   ▒=";JP
404 PRINT"■TIME=";TI$
410 IF SC>HC THEN HC=SC:PRINT" NEW HIGH SCORE!!":GOTO 440
420 PRINT"■■    HI-SCORE=";HC
440 FOR PA=1TO 1000:NEXT
450 PRINT"PRESS SPACE TO PLAY"
460 R=PEEK(197):IF R<>32THENGOTO 460
470 GOTO 40
499 END
1000 X=INT(RND(1)*20)+1
1002 IF RND(1)>.9 THENX=INT(RND(1)*16)+1:PRINTTAB(X)"♣♣♥♣♣":GOTO1020
1005 IF RND(1)<.1 THENPRINT TAB(X)"♠":GOTO 1020
1008 IFVAL(TI$)<300THENPRINTTAB(X)"♣":GOTO 1020
1010 IFX>16THENX=X-5
1012 IFVAL(TI$)>=300 THENPRINTTAB(X)"♣♣♣"
1020 LI$=RIGHT$(STR$(LI),1):PRINT"■SCORE";SC;"TIME";RIGHT$(TI$,3)" H";LI$
1030 PRINT"■■■■■■■■■■■■■■■■■■■■■■"
1040 RETURN
2499 REM RAMP
2500 RD=INT(RND(1)*20)+1
2505 RD=RD+8076
2508 FORCL=RDTORD+110STEP22:POKECL+30720,0:NEXT
2510 POKE RD,102:POKERD+22,88:POKERD+44,88:POKERD+66,88:POKERD+88,88
2530 RETURN
3000 REM NOISE
```

```
3100 POKE36878,15
3105 POKE 36877,0
3110 POKE 36876,220
3120 FOR M=1TO5:NEXT
3130 POKE 36876,0:POKE 36877,128:POKE36878,6
3140 RETURN
3499 REM JUMP
3500 IF Q=15 THEN 100
3510 IF Q=1THEN BR=6
3520 IF Q=10 THENBR=4
3525 POKE L-22,32
3530 GOSUB 1000:POKE L,8:POKE L-22,32
3535 FORPA=1TOQ:NEXT
3550 FOR QW=1TOBR
3560 GOSUB 1000
3570 FORPA=1TO Q:NEXT
3580 POKE L,8:IF QW=1THEN POKE L-44,102
3590 POKE L-22,88
3600 NEXT
3610 IF PEEK(L)+22=88THEN 300
3615 SC=SC+50
3617 IF Q=1THEN SC=SC+50
3619 JP=JP+1
3620 GOTO 100
```

Bongo Maniac

Three short unexpanded Vic programs from Iain Gartside and Stephen Ward of Manchester

THESE THREE short sound and graphics routines could be incorporated into your own programs.

The first is Computer Maniac, which is the sound of a computer going mad!

The second is Sound and Colour, which gives a synchronised sound and colour effect.

The last is Bongo Drums, which represents the sound of someone beating wildly on the bongoes.

```
2 PRINT"□**********************"
3 PRINT"■■I ■AM ■A ■COMPUTER ■MANIAC"
4 PRINT"■————————————————————"
6 PRINT"■▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼"
10 POKE36878,15
20 C=INT(RND(1)*50)+175
30 S=INT(RND(1)*255)+1
40 POKE36879,C
50 POKE36875,S
60 FORT=1TO100:NEXTT
70 GOTO20
```

```
2 PRINT"□**********************"
3 PRINT"■■■     SOUND■ & ■COLOUR"
4 PRINT"■————————————————————"
6 PRINT"■▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼"
10 POKE36878,15
20 S=INT(RND(1)*55)+175
30 C=INT(RND(1)*50)+1
40 POKE36879,C
50 POKE36875,S
60 FORT=1TO100:NEXTT
70 GOTO20
```

```
10 S8=36878
20 S7=36877
30 S6=36876
40 S5=36875
50 S4=36874
60 POKES8,15
65 POKES5,123
70 POKES7,255
75 POKES8,0:FORT=1TO50:NEXTT:POKES8,15
80 POKES6,155
85 POKES8,0:FORT=1TO50:NEXTT
90 RESTORE:GOTO60
```

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Tony Rushbrook of Dartford, Kent, sends this 64 game

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Use F1 to drop bombs.

Program notes

Lines 0-3; level of play
Lines 3-6; define characters
Line 100-113; set up screen
Lines 113-119; control movement
Lines 120-1000; drop bombs
Lines 2000-3000; sound effects
Variable A = plane position, P = bomb position, BOMBS = bombs left.

```
0 INPUT"■LEVEL 1-EASY 2-HARD 3-IMPOSSIBLE";A$
1 IFA$="1"THENBOMB=500
2 IFA$="2"THENBOMB=300
3 PRINT"■PLEASE WAIT":IFA$="3"THENBOMB=200:
4 POKE56334,PEEK(56334)AND254:POKE1,PEEK(1)AND251:FORJ=0TO2039:
POKE12288+J,PEEK(53248+J)
5 NEXT:POKE1,PEEK(1)OR4:POKE56334,PEEK(56334)OR1:FORG=12288TO12295:
READJ:POKEG,J:NEXT
6 DATA 0,128,192,252,170,127,44,0
7 POKE53272,28
40 FORT=1TO300:NEXT:POKE54273,17
100 PRINT"■■■
```

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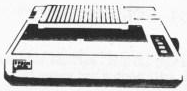

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Slipping a disk too many

***Pete Gerrard** looks at floppy games, and on the whole is pretty much disk-gusted*

When a program has had a vast amount of pre-release hype projected around it, it comes as something of a relief when the program concerned actually lives up to expectations. Such was the case with Commodore's **International Soccer** cartridge.

However, when the program does not perform as the press releases, hand-outs and pre-release publicity would have us believe, then the disappointment with the program is that much keener. **Alice in Videoland** falls regrettably into this latter category.

Written by the same programmer as Audiogenic's earlier success **Motor Mania**, this disk and joystick essential game does have quite a good opening scene, albeit very poorly scrolled around the screen. The game starts when an animated Alice jumps down a rabbit warren and falls down and down and down. You have to move her around and collect baskets, keys, food and drink, whilst avoiding bumping into lamps and pictures. When Alice lands, you then have to use the keys collected earlier to move through a variety of doors of different sizes (which is where the food and drink come in, to make your character grow and shrink in size), to find rooms which look bizarre to say the least.

Jabberwocky

Being hit by a flying clock signals the end of this part of the game, and you are presented with a few lines of text from the Alice in Wonderland book while waiting for the next part of the program to load.

This time you're out in the garden, with a cheshire cat grinning amiably at you while a pipe-smoking caterpillar blows deadly smoke rings everywhere. Alice has to jump around and collect bread-and-butterflies and rocking horses (which turn miraculously into croquet balls in part four of the game), avoiding the aforementioned smoke rings and seeds which three particularly violent flowers keep spitting everywhere.

The third part of the program I found to be the most tedious of them all. The action has now moved on to a chess board, featuring Alice and two white knights on one side, and Tweedledum and Tweedledee (with a little help from the Jabberwocky) on the other. Alice has to get from one side of the board to the other, using the knights to temporarily restrain her opponents. Her speed of movement is snail-like to say the least, and once you've put a knight on the Queen's Rook 7 square it appears impossible to move it again: a bugette, perchance?

The final part of the game is a ridiculous game of croquet, complete with flamingo as mallet (but no hedgehogs as croquet balls).

Ten levels of skill are offered to you at the start of the game, although there didn't appear to be much difference between any of them that I could detect. Not a game I can imagine returning to very often: nice graphics, shame about the game.

Regular readers of this illustrious magazine will recall a review a few months ago of a game called **Forbidden Forest**, written by one Paul Norman, and released over here by Audiogenic. The review was pretty favourable, although the hope was expressed that there might be some better software on the way shortly.

Well, **Caverns of Khafka** is the next offering from young Norman, and if the standard of this game is anything to go by, he's a mighty fine programmer who is improving all the time. This is essentially an adventure game, but with one major difference from most of them. Not only does it rely entirely on the use of graphics, but also your only control over the player is via a joystick rather than the keyboard.

You have a number of caverns to explore, and these are depicted on the screen in a glorious 3 dimensional display, which scrolls in all directions as you move your hero around the place. He can throw and climb ropes (which produces some ludicrous graphical displays at times), crawl along on his stomach, jump all over the place, and also shoot any of the many nasties that come at hime. Falls of a great distance are to be avoided, as is bumping your head on a rock above you. Five lives are awarded in all, and you're reminded of any lives lost by a number of tombstones at the top of the caverns.

Escalator

This is not an easy game to play, and the beginner will do well to practise moving about at the top of the caverns before plunging in and taking on the game itself. In one place, where the going gets rather tricky, there is an escalator to help you out. Alas, and this is a criticism of all games that rely on the joystick to perform a number of different feats, it is all to easy to try and move the escalator and end up placing a seal on the door of a tomb.

That aside, this is a very worthy follow up to Forbidden Forest, and if enough games enthusiasts have got disk drives it should do very well indeed.

Another from Audiogenic, **Frantic Freddie** is aptly named. I guarantee that anyone who buys a copy of this game will be driven frantic by the musical background that accompanies it.

If this game was played in total silence, it would be a reasonable (but not a great) piece of software. However, each of the ten screens has a (supposedly) different piece of music being played whilst your on that screen, and the quality of the music is quite superb. Some of the tracks being played are a little obscure (Kaleidoscope by Paul Simon surely won't be known by too many people?), but their rendering is simply wonderful.

Even on the initial display, before you start playing the game, there's a spirited rendition of Crazy Little Thing Called Love, the Queen number.

Still, the game itself. Freddie, a ▶

Alice in Videoland — graphics good, game grotty?

◀ telephone engineer, one day happens to stumble across a magical telephone network. Pots of gold sit around all over the place, and you have to get them all. However, these pots of gold are guarded by various creatures, and one touch is (as they say) deadly. Life is made a little more complicated by the fact that you can't go through telegraph poles, and have to climb up and around them, whereas the aliens can march smartly through.

Interludes

Apart from the music, nothing much changes from level to level. It does get a bit harder, but not by much. An interesting interlude is offered between some of the levels, which it's worth playing to get to see. On the first interlude, we see our hero being chased and finally caught by a massive frog, but on the second one Freddie has his revenge, and after being chased off one side of the screen by the frog he re-appears driving a massive tank and blasts the frog to smithereens.

So, for all those who like trying to name that tune in one, a game to keep an eye (and ear) out for.

One company who've gone into disk based games in a big way is Microdeal down in Cornwall, and the rest of the disk games looked at this month belong to them. Micodeal, as we all should know, made their name by producing a lot of good Dragon software. Unfortunately, with only a couple of exceptions, they don't seem to have got the hang of the 64 yet.

Grabber is an unusual variation on the maze theme, with two mazes instead of one. Eight treasures are divided up between the mazes, and it is your job to go around and collect all of them. However, the mazes are guarded by what Microdeal refer to as Googlies, and they have a habit not only of bumping into you and killing you, but also of making off with your treasure after you've safely stashed it away.

You swap around from maze to maze by pressing the fire button, which is a convenient way of getting out of the way of a particularly nasty googly. On some of the later levels the only possible way of completing the game is by continuously swapping around. This is because in one maze you're represented by a conventional looking character, who can't walk through

Forbidden Forest — a disk-drive favourite

walls, while the character in the other maze is simply a square box which has the magical ability to brush walls aside as though they were matchsticks. Thus by jumping from one character to another you can get your way out of some pretty sticky situations indeed.

Suicidal

Some pretty crude graphics are used throughout the game: I expect to lose a life to something a bit more dramatic than just expanding a sprite in both directions. Also the sound, as with a lot of Microdeal games in fact, is tedious bordering on the suicidal, and although I don't particularly like playing games in silence this is one occassion when I happily broke all the rules and played on in blessed peace and quiet.

An unfortunate start from a company whose reputation promises better than this.

You see a full page advertisement for a game, and you immediately begin to think that perhaps that game is going to be a bit special. **Arena 3000** does not live up to its advertising, and indeed it was quite hard to remember what the game was about without referring to my notes when it came to writing the review: not the sign of a good game.

It is one of those offerings where you start off in the middle of the screen, and have to shoot the variety of aliens who march relentlessly towards you all the time. In common with most Microdeal disk games there are absolutely no instructions supplied either with the disk or on the screen, so a couple of lives will be lost while you try and figure out which port the joystick ought to go in. Port 2 is the answer, if you happen to buy a copy. Another peculiarity about this game is that it started the cassette motor going when it finished loading. Why is this? It's totally unnecessary, and one can only assume that the program isn't yet totally at home with the 64.

Nothing in particular changes from level to level. More aliens appear in the time honoured tradition, but nothing else seems to happen. A game that I, and everyone else here at the mobile Gerrard games centre, became very quickly tired with.

Most of you will probably be familiar with the game of Pengo, or Bengo as it is sometimes called, but for the benefit of the Tibetan Monks amongst us, here goes with a summary of **Pengon.**

Snobees

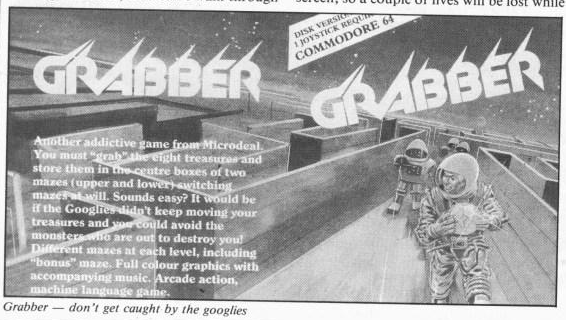
The game takes place in the frozen wastes of the arctic, where you, a cheerful little penguin, suddenly find yourself being attacked by hordes of ferocious snobees. In order to get rid of the snobees you have to push blocks of ice around, and hopefully pin the blighters against the sides of the screen by doing so. Points are scored for every snobee killed, and in this Microdeal version of the gamè you also get points for every block of ice moved, regardless of whether or not it succeeds in getting rid of one of the enemy.

The original game I liked, and can remember spending many a ten pence piece in a vain bid to get my name on the highest score list. This, however, is not a worthy version of that original program.

Not a game that went down well here, and since our games team covers most age groups I can't really see this doing very well.

The remaining Microdeal games are definitely in a class above the previous ones, and **Danger Ranger** had me playing it for a long, long time.

You control a little man whose job it is to collect ten keys from the Chamber of Pasha. The Chamber of Pasha is in fact little more than a collection of yellow planks across the screen, with a handy transporter at the bottom to take you back up to the top should you step on it. Five planks in all, with two keys per plank, each one is guarded by something or other. Microdeal refers to them as floating urns,


GRABBER
DISK VERSION
1 JOYSTICK REQUIRED
COMMODORE 64
GRABBER
Another addictive game from Microdeal. You must "grab" the eight treasures and store them in the centre boxes of two mazes (upper and lower) switching mazes at will. Sounds easy? It would be if the Googlies didn't keep moving your treasures and you could avoid the monsters, who are out to destroy you! Different mazes at each level, including "bonus" maze. Full colour graphics with accompanying music. Arcade action, machine language game.

Grabber — don't get caught by the googlies

radioactive bats, and roving eyes.

Your little man has the ability to move left or right, jump or duck, and fire at any of the hazards that confront him. If you manage to collect all ten keys you are then taken onto the next level, which is very difficult to get through. You have to run along a series of blocks, watching out for drops of acid and the four demons that guard this level. Unfortunately, the drops of acid appear at random, and since you start off at the top of the screen and they move very swiftly downwards, you can guarantee on losing at least one life on this level.

Spaced out

If you manage to complete this it's back to the first stage again, but with more nasties out to get you. An interesting and entertaining game: nothing special in the way of graphics or sound, but a fine idea and one that has been nicely implemented.

This Cuthbert chappie seems to get everywhere, and now we find him deep in **Cuthbert in Space,** a game that bears more than a passing resemblance to Jetpac from Ultimate.

Cuthbert has been sent on a mission of plunder in the heart of the Moronian solar system. On landing on each planet, you have to refuel Cuthbert's ship by flying around in your jet-propelled way to a number of fuel dumps conveniently sited on the screen. To make life more interesting, you can only carry one fuel 'pod' at a time, and the longer you take to collect them all, the more meteorites come flying across the screen at you. You can shoot them down, but by the time you're on the last couple of pods there's so many of them that you're almost bound to lose at least one life.

DANGER RANGER
Danger Ranger must collect ten keys from the Chamber of Pasha, whilst warding off the Floating Ums, Radio- active Bats and Roving Eyes. Then he must face the Acid Chamber to collect all the Treasure Chests, avoiding not only the drops of acid, but shooting the four demons which guard the chamber. Five levels of Play. Sound Effects. High Speed arcade action game. Full colour graphics. Machine Language.
DANGER RANGER

Danger Ranger — collecting keys and avoiding acid

Challenge

After acquiring enough fuel, you have to whizz around and collect as much treasure as you can before you're forced to take off and land on another planet. To escape the tedium of having every level looking remarkably the same, occassionally you will get an engine malfunction and have to send a pilotless shuttle to obtain spares from some spot whose co-ordinates are given on the screen. Meanwhile, the evil Moronians have planted a bomb on your spaceship, so this shuttle is also involved in a race against time, to get back and take off before the bomb explodes.

This is quite a challenge. Still, I usually managed to survive.

After that it's back to the main game again, and more heads down, no nonsense, mindless alien blasting. Good fun, even if it isn't particularly original.

As an overall conclusion, the standard of disk based software isn't yet up to the highest quality arcade games, and once again we can only sit back and wait for the better software that is sure to come from someone, somewhere. ■

Cuthbert in Space
The Federal Chief has decided that Cuthbert is to go on a mission of plunder against the Moronian's Solar System. Cuthbert lands his spacecraft on each planet but then has to refuel by stealing pods from the Moronian fuel dumps whilst avoiding the Solar Meteoroid Barrage. After filling up he goes and plunders as much loot as possible before take-off. All could go well but when he gets a malfunction he must send a pilotless shuttle to obtain spares and take-off before the Moronian's bomb detonates
Cuthbert in Space

Cuthbert in Space — plundering the Moronians

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THIS IS YOUR chance to win a copy of Sunshine's best-selling *Commodore 64 Disk Companion*, by David Lawrence and Mark England. The book is the authoritative guide to making the most of the 1541 disk drive, with simple introductions to the theory and practice of disk storage, backed up with programs for manipulating the disk directory, recovering "scratched" files, merging files and displaying the structure of the disk operating system.

If you can't tell the difference between sequential, relative and random access files, this is the book for you! Normally £7.95 in the shops, but ten lucky winners will receive free copies from Sunshine. Simply answer the ten questions and complete the tie-breaker, then send your entry to Commodore Horizons Disk Competition, 12/13 Little Newport Street, London WC2, with your name and address, to arrive no later than the last working day of October. Normal competition rules apply.

1) What is the name of the process used for dividing a disk into "Tracks"?

2) What is the meaning of the abbreviation BAM?

3) What is the microprocessor found in the 1541 disk drive?

4) How many bytes can be stored in one sector of a 1541 disk?

5) How many tracks are there on a formatted disk?

6) Is it dangerous to remove a disk when the RED light *or* the GREEN light is lit?

7) What is the product name of Commodore's new "fast" disk drive?

8) And what is the name of the 1541's immediate replacement?

9) What is the 1541's normal device number?

10) Which is *not* a disk command: SCRATCH; VALIDATE; RENAME; NUMERATE; COPY

Tiebreaker (complete in 15 words or less) — "You should never slip a disk . . ."

Delving into disk drives

A further adaptation from ***The Commodore 64 Disk Companion*** *by* ***David Lawrence*** *and* ***Mark England***

THE FIRST use that anyone makes of a disk is to store programs. There is no doubt that, if you enjoy computing and use your 64 more than occasionally, the difference in speed with which you can access programs makes the cost of a disk drive worthwhile compared to a cassette recorder.

At the same time, it is always surprising how little care most people take in the keeping of programs that they have spent long periods developing, failing to save regular updates when a program is being developed, failing to check that a program has been properly saved, keeping only one copy of important programs and abusing disks by leaving them around exposed to the elements. Given below are one or two common-sense rules when it comes to saving programs.

As you develop new programs, SAVE them regularly. Like any other micro-computer, the 64 can lose programs if there is a momentary surge in the electricity supply, or if someone kicks the plug, or even because in your programming you manage to upset the 64's equilibrium. How much work you will have lost will depend on how long it has been since you last saved your program. If a program is being entered rapidly, you should not normally expect to enter lines for more than 15 minutes without resaving the program. When a program is being debugged, so that relatively fewer changes are being made, perhaps you might increase that period to half-an-hour. It really depends on how much you are prepared to lose, but you can depend on the fact that if you do not save programs regularly you will, sooner or later, lose an important program that has taken a long time to enter.

SAVEing

In order to embark on a policy of SAVEing programs regularly, you need first to know the command which will store a program on the disk drive. If you have previously been working with a Datassette cassette recorder, then you will have become used to the format:

SAVE"<PROGRAM NAME>"

to SAVE a program or:

LOAD"<PROGRAM NAME>"

when LOADing a program back into memory.

With your disk drive installed, the situation changes slightly. While the 64 can work perfectly well with the 1541, it is designed on the assumption that it will be used with a cassette recorder. This fact allows users of a tape recorder to get away without specifying one very important piece of information, namely the number of the device on which the program is to be stored. The device number of the cassette recorder is one, and when the instruction:

SAVE "PROGRAM"

is entered, the 64 assumes that what is meant is:

SAVE "PROGRAM",1

When working with disk, the programmer cannot rely on the 64 to put this important piece of information in, so the format of the SAVE command will normally be:

SAVE"<PROGRAM NAME>",8

and of LOAD:

LOAD"<PROGRAM NAME>",8

When a single disk drive is bought from the dealer, it is set up internally to think of itself as device eight, and it will respond to any instructions addressed to a device with that number, like the SAVE and LOAD commands in the last section. An increasing number of people, however, are discovering the advantages of running more than one disk drive. With more than one drive, however, a problem arises in that the drives *must* know which of them is being addressed at any one time.

Devices

To overcome this, 1541 drives are built with the ability to change their device numbers so that a command can, for example, be issued in the form:

SAVE "PROGRAM",9

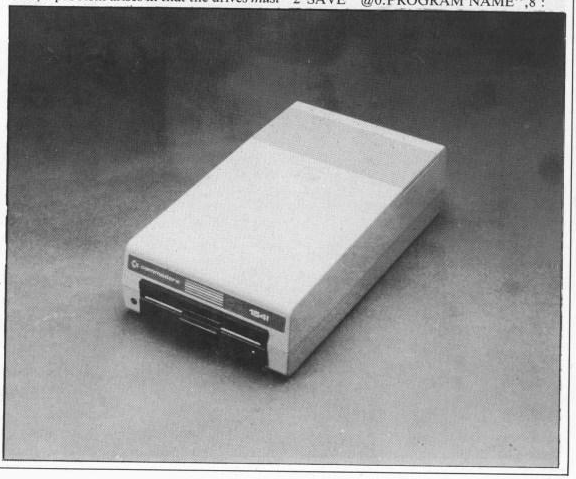
to access one of the drives, leaving device eight completely untouched. There are two ways in which disk drive device numbers can be changed, in hardware and in software, that is to say you can either make a modification to the equipment itself or you can use a program to make a temporary change. Of the two, if you are going to be permanently using more than one drive, the hardware solution is by far the best. It normally involves making a small cut in a single track of the printed circuit board inside the drive. Details of this are given in the 1541 manual but they are not very clear and, frankly, we would recommend that when you purchase your second 1541 you do so on the understanding that the dealer will do the two minutes' work involved. If your dealer baulks at the idea then perhaps you might consider finding one who knows what he is doing.

Tiresome

To change the device number of a disk drive with a program is not difficult (see Chapter 13), but it can become tiresome, since it has to be done every time the drive is switched on. Even so, if you are merely borrowing a friend's drive for the day, the software solution is a better one than ripping his drive to pieces.

To make saving a program easier and to encourage yourself to *do* it, it is a good idea to build a program saving facility into each program you develop, along the following lines:

```
1 GOTO 3
2 SAVE "@0:PROGRAM NAME",8 :
```



```
VERIFY "PROGRAM NAME",8 :
STOP
3 REM
```

Including such a routine in a program has the virtue that you are unlikely to save the program under the wrong name due to a typing error, it can be saved simply by entering GOTO 2: as an added bonus, it means that all your programs can be started with a uniform GOTO 1 if you do not wish to use RUN and wipe out any stored variables.

Two features of this routine need some explanation, the command VERIFY and the modifier '@0:' at the beginning of the program name.

One of the main reasons for building the SAVE routine into the program as shown is that it can then be combined with VERIFY. The purpose of VERIFY is to check that a program stored on a specified device is the same in every respect as the program currently in memory, ie that a program has been correctly SAVEd. The format of verify is:

VERIFY "<PROGRAM NAME>", <DEVICE>

where PROGRAM NAME is the name of a program stored on the device. Note that it is not important that the name of the program on the disk is the same as the name that you have allocated to the program in memory. The name of the program is stored on the disk's directory but not with the program itself, and no name is stored in the memory of the 64 for the current program. All you are doing is giving the disk drive the information to find a particular file.

Verify

Unlike the cassette recorder, the disk drive requires no work from the user when VERIFY is employed. In the little SAVE routine in the previous section, the drive will automatically search out the program which has been SAVEd without the user intervening.

Fig 1

BYTE	REMARK
0	Type of file in use 0 = Unused or DELeted file 1 = Unclosed SEQuential file 2 = Unclosed PRoGram file 3 = Unclosed USeR file 4 = Unclosed RELative file 128 = Closed DELeted file 129 = Closed SEQuential file 130 = Closed PRoGram file 131 = Closed USeR file 132 = Closed RELative file
1	Track of first block in file
2	Sector of first block in file
3-18	File name padded with shifted spaces (CHR$(160))
19	Relative files — track of first side sector of file Other file types — Not used
20	Relative files — Sector of first side sector of file Other file types — Not used
21	Relative files — Length of record Other file types — Not used
22-25	Not used
26-27	Only used when disk is SAVEing or OPENing a file with '@0:'
28-29	Number of blocks in this file

Fig 2

```
  10 DIM DI$(150) : DEV = 8
  20 GOSUB 1000
  30 FOR I = 0 TO DP-1
  40 PRINT CHR$(34) DI$(I)
  50 NEXT
  60 END
1000 REM # ************************
1010 REM READ 1541 DIRECTORY
1020 REM ************************
1030 DP = 0
1040 OPEN 8,DEV,0,"$"
1050 GET # 8,T$ : GET # 8,T$
1060 GET # 8,T$ : GET # 8,T$ :
     IF T$="" THEN CLOSE 8 :
     RETURN
1070 GET # 8,T$ : GET # 8,T$
1080 GET # 8,T$
1090 IF T$< >CHR$(34) AND T$<>""
     THEN 1080
1100 IF T$="" THEN 1060
1110 T1$ = ""
1120 GET # 8,T$
1130 IF T$< >"" THEN T1$ =
     T1$+T$ : GOTO 1120
1140 DI$(DP) = T1$ : DP = DP+1
1150 GOTO 1060
```

In one respect the disk drive is a little less easy to use than the Datassette recorder. When you wish to store a program for a second time on tape, all that you have to do is rewind the tape and issue the SAVE command — the previous program will be overwritten. Not so with the disk drive, for it is specifically designed to prevent you from making the mistake of accidentally overwriting a file by unwittingly SAVEing another of the same name. This is fine in most circumstances but when successive versions of a program are SAVEd it can become a little tiresome. The Disk Operating System (DOS) provides a facility to overcome this problem in the form of the modifier '@0:' attached to the front of the name of a file (whether a program file or any of the other kinds described later — with the exception of relative files).

When the DOS comes across a filename which begins with '@0:' it immediately scans the current disk to see whether there is a program with the same name as the specified filename *less* the '@0:'. If there is not, then the program is stored normally. If there *is* a program of the same name, the program being SAVEd replaces it on the disk — the previous version will not be recoverable since it is overwritten.

Corrupt

A note of caution has to be sounded over the use of '@0:', due to the fact that the routine which runs the facility has a 'bug'. On disks which are becoming full, you will sometimes find that the use of '@0:' will successfully store the file named, but will corrupt other files on the disk. The reason for this is that '@0:' seems, under some circumstances, to fail to register in the Block Allocation Map (BAM) the correct picture of the sectors on the disk which it has used or which it has freed, so that subsequent files are SAVEd in places they should not be.

There are several solutions to this problem: 1) Include a VALIDATE command in line 2 of the little SAVE routine earlier in this article. This reconstructs the BAM and ensures that there will be no corruption, the only drawback being that it can take longer to VALIDATE than it does to format a disk. 2) Start off by calling the program something like TEST01 and, each time you SAVE it, LIST line 2 and change the number on the end of the program name. This is perfectly simple but it does take up a lot of disk space while a program is being developed. 3) Ignore the bug — it will very seldom, if ever, affect you. 4) Best of all, use RENAME and SCRATCH, two housekeeping commands, to create a much more stylish and secure method of SAVEing programs and other types of file.

Valuable

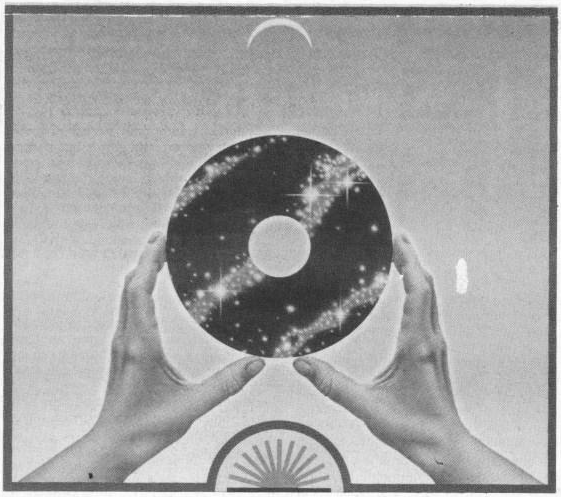
The process of keeping a valuable program safe does not end once you have stored it on a single disk. Disks can be damaged or accidentally corrupted in some way. If a program is worth keeping, then you should *always* have a second copy of it stored somewhere safely away from where you normally keep your disks.

In addition, don't neglect the relative safety and reliability of tape for backup copies of important material. A serious disk drive fault can be extremely frustrating if your only copies of the required program are on disk. If experience is anything to go by, most people starting out with a disk drive will ignore this advice, at least until the first occasion on which they totally lose a program on which they have been working for weeks.

In last month's article, we included a brief description of the disk directory. Since then

Fig 3

```
  10 OPEN 15,8,15 : OPEN 8,8,8,"#"
  20 DIM DI$(150)
  30 GOSUB 1000
  40 FOR I = 0 TO DP
  50 T = ASC(DI$(I)) : IF T>129 AND
     T<=130 THEN PRINT MID$
     (DI$(I),4,16)
  60 NEXT
  70 CLOSE 8 : CLOSE 15
  80 END
1000 REM # ************************
1010 REM READ DIR. INTO DI$
1020 REM ************************
1030 DP = -1 : NT = 18 : NS = 0
1040 TR = NT : S = NS
1050 PRINT # 15,"U1:" 8;0;TR;S
1060 PRINT # 15,"B-P:" 8;0
1070 GET # 8,T$ : NT =
     ASC(T$+CHR$(0))
1080 GET # 8,T$ : NS =
     ASC(T$+CHR$(0))
1090 IF TR=18 AND S=0 THEN 1040
1100 PRINT # 15,"B-P:" 8;0
1110 FOR I = 0 TO 7
1120 GET # 8,T$ : GET # 8,T$
1130 DP = DP+1
1140 DI$(DP) = ""
1150 FOR J = 0 TO 29
1160 GET # 8,T$
1170 DI$(DP) = DI$(DP)+LEFT$
     (T$+CHR$ (0),1)
1180 NEXT J,I
1190 IF NT>0 THEN 1040
1200 RETURN
```



we have taken the function of the directory, in allowing the user to examine the contents of a disk and in allowing the Disk Operating System to find specified files on the disk, rather for granted. In this section we shall take a brief look at the directory, its layout and the way in which it may be directly accessed by the user.

In last month's article the overall layout of the tracks which make up the directory is given. Examining the table shows that the directory is held on track 18 of the disk, beginning at sector 0. The first sector of the directory is given over to the Block Allocation Map, but the remainder of track 18 is reserved for the details of individual files on the disk. Each of these sectors is capable of holding the details of eight files. Given that there are 17 sectors on track 18 of the disk, simple arithmetic shows that the maximum number of files which the disk can hold, regardless of how much space is free, is 16*8, or 144.

Within the overall structure of the directory, the format of the entry for a single file is given in Table 1.

The file types, stored in byte 0 of the entry, can be made use of in an UNSCRATCH program, where file types are altered to reinstate files which were registered in the directory as having been deleted.

Filename

The first track and sector bytes, and the filename itself, can be used by a program to trace through the sectors allocated to each particular file and then to display the name of the relevant file against each sector on the disk. In normal use, the purpose of these bytes is to allow the DOS to search through the directory for a specified filename and then to find the beginning of a file which it has been instructed to access.

Relative files are in fact made up of two quite separate sections, one containing the data and the other recording where the sectors holding the data are on the disk. The table shows that the start address of this second part of a relative file is held in bytes 19 and 20, while the fixed length of each record in a relative file is held in byte 21.

Bytes 26 and 27 are new to us, but their use is quite simple. When a file is SAVEd or OPENed using the '@0:' modifier to specify that any previous file of the same name and type is to be overwritten, these bytes serve the purpose of holding the starting track and sector until the new file has been created.

Directory

Finally, when the directory is displayed for the user, the size of each file in terms of the sectors used is given with it, and this figure is stored in bytes 28 and 29 of the file entry.

In all, each individual file entry in the directory takes up 30 bytes (0-29). In order to space the eight possible entries regularly within the 256 bytes of the sector, two extra bytes are added to the end of the first seven entries. These bytes contain no useful information, their purpose is solely to allow the DOS to scan along the directory in steps of 32 bytes.

There are two main ways in which the directory may be read: 1) By loading it into memory with the command LOAD "$", <DEV>, where DEV is the device number of the particular drive. When loaded in this way, the directory is treated in much the same manner as a program file, and any program presently in memory is lost. Loading is possible because the '$' indicates to the DOS that it has to translate the directory as it is on the disk into program file format, treating each entry as if it were a program line, supplying the zero bytes to finish lines and space for link bytes. In other words, the format supplied to the 64 when the LOAD "$" command is entered is entirly different to the format of the directory on the disk itself.

2) By reading the directory from the disk under program control. The 'DOS support' software provided free with later 1541s provides a neat means to accomplish this and print the contents of the directory to the screen without interference to the current program. It is, however, quite possible to read the directory from BASIC. Given in Figure Two are two short programs which will load the contents of the directory into an array, the first by reading the directory file much as a program file would be read (see Chapter 8), and the second reading the disk more directly.

Arrays

The DOS supplies the directory in the form of a program file, with every filename built into a separate line and the whole thing properly structured with link bytes and so forth. There is no point in trying to compare what is being read by the GET # statements with the contents of the table at the beginning of the chapter, since there is almost no relation between the two. What is being read here is not the directory itself but the translated version of the directory supplied by the DOS.

Figure Three gives a program for reading into an array from disk.

Lines 10-80: This section controls the execution of the program. Its three main functions are to open the error channel and call for the allocation of a disk memory buffer, to call up the next module, and then to print out selected files from the array DI$.

Lines 1000-1200: The overall function is to read the contents of the directory into the array DI$.

Lines 1050-1060: The contents of a single sector are read into the buffer and the buffer pointer set to the beginning of the buffer. The first sector to be read will be track 18, sector 0.

Lines 1070-1090: The first two bytes of the sector, which are pointers, are obtained and stored in the two variables NT and NS, standing for Next Track and Next Sector. On the first pass through the module, the sector picked up will be the BAM, so the program immediately moves on to the next sector.

Fig 4

```
30900 GOTO 33000
31000 REM# **********************
31010 REM READ 1541 DIRECTORY
31020 REM **********************
31030 DP = 0
3140  OPEN 8,DEV,0,"$"
31050 GET#8,T$ : GET#8,T$
31060 GET#8,T$ : GET#8,T$ :
      IF T$="" THEN CLOSE 8 :
      RETURN
31070 GET#8,T$ : GET#8,T$
31080 GET#8,T$
31090 IF T$< >CHR$(34) AND T$<>""
      THEN 31080
```

Lines 1100-1180: The buffer pointer is set back to the beginning of the block, then the eight file entries contained in the sector are successively read. This involves discarding the two unused leading bytes and then obtaining the next 30 characters. The 30-character entry is then placed in a line of the array DI$.

Lines 1190-1200: If the next track pointer indicates track 0 at this stage it is a sign that the sector which has just been dealt with is the last in the directory.

Given the flexibility of the means provided by the LOAD "$" method and the DOS support facility to print the directory, there are few occasions on which it is worth reading the directory directly. One use, however, might be whenever an operation is to be performed on multiple files. Very few commands could be used with the pattern matching facilities that the 1541 supports. With a little bit of programming, however, it is relatively easy to construct routines to carry out an operation on a whole series of files which match a certain pattern, and this depends on the ability to read and make use of the information contained in the directory.

Figure 4 gives a program which will repeat an operation on a number of files.

Lines 31000-31150: The module to read the filenames from the directory using the first of the two methods illustrated in the second section of this article.

Lines 32000-32100: These lines compare two strings, one of which is the name of a file taken from the directory, the second being a string input in the next module which is the pattern against which all the disk files are to be matched. The pattern may be set up using the '*' and '?' indicators. The only important product of the module is the value of the variable SAME. If the filename being considered by the module matches the pattern, then the value of SAME will be left at minus one, otherwise it will be zero when execution of the module ends.

Lines 33000-33200: This section is the main control module, which first calls up the module at line 31000 to read the directory into the array DI$, then sends successive file names to the preceding module for comparison with the pattern input by the user. An extra facility is provided in the form of the creation of TY$, which records the type of the file. No use is made of this in the current program but you might like to employ it to exclude certain file types from an operation, regardless of their name.

Module

In actual use, there would need to be another module specifying exactly what action was to be performed on a file which matched the pattern. This extra section would be written as another subroutine and would be called by the GOSUB at line 33180. *Note:* Since there is no valid line number at 33180, the routine cannot be run successfully in its present form — you *must* first add the new section specifying the action to be performed. Given below is an example procedure illustrating the use of the REPEAT facility.

1) Enter and SAVE the REPEAT program given above.

2) Take a disk which contains no important files (something may go wrong!) or format a new disk and SAVE on it three files with different names — the content of the files is irrelevant but the filenames should be *less* than 16 characters long.

3) LOAD the repeat facility and amend it by entering the following new or changed lines:

```
38180 GOSUB 34000
34000 REM ****************************
34010 REM RENAME ALL FILES
34020 REM ****************************
34030 OPEN 15,DEV,15
34040 COM$="RENAME0:Z" + N$ +
      "=0:" + N$
34050 PRINT#15,COM$
34060 CLOSE 15
34070 RETURN
```

4) SAVE the amended program under the name REPEAT2.

5) RUN the program and, when asked to enter the pattern, simply press RETURN which enters a single asterisk indicating that any filename will be acceptable as a match.

6) When the program terminates, load the directory and you should find that every one of the files on the disk has a 'Z' at the beginning of the filename. If so, you have successfully carried out a procedure which would be impossible by means of normal pattern matching. ■

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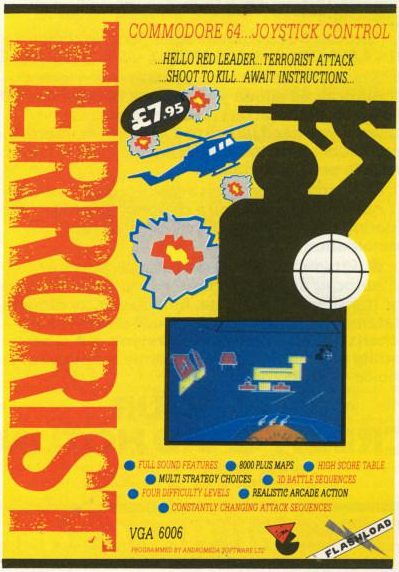

THE SPREADSHEET IN A CLASS OF ITS OWN

CBM 64 TAPE ONLY £14.95

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Q: Which spreadsheet is suitable for accountants, engineers, scientists and home users?
A: Autocalc 64 is ideal for any application involving extensive manipulation of data and formulae from financial planning to market research.

Q: Which spreadsheet offers an advanced level of formula handling?
A: Autocalc 64 copes easily with trignometrical functions, parenthesis and boolean logic as well as totalling and averaging.

Q: Which spreadsheet accepts complex conditional statements?
A: Autocalc 64 can handle statements as complex as IF a1<4,000 OR a1>8,000 AND a2 = 500 THEN b1=0.

Q: Which spreadsheet offers a flexible screen format?
A: Autocalc 64 allows you to select (i) column widths from 3 to 30 characters (ii) the number of rows/columns you need (iii) up to 2,000 cells of information (iv) text or numerical entries lined up to the right or the left, or a combination.

Q: Which spreadsheet offers a choice of numerical formats?
A: Autocalc 64 gives you a choice of (i) integers (ii) floating decimal point (iii) currency (iv) any combination of these.

Q: Which spreadsheet offers a full 'replicate' facility?
A: Autocalc 64 has an advanced replication function for transferring text, data, formulae or conditional statements from any cell (or block of cells) to any other(s) without monotonous retyping. A 'go to' facility will take the cursor instantly to any cell of your choice — saving time.

Q: Which spreadsheet is easy to use yet advanced in operation?
A: Autocalc 64 is designed to guide you — helpful error reports diagnose input or formulae errors. A full demonstration program and comprehensive instructions are included.

Q: Which spreadsheet is compatible with standard Commodore printers?
A: Autocalc 64 gives you a printout facility using any of these printers: Commodore 1515, 1525, MPS 801, 1526, MCS 801, DPS 1101, Seikosha GP100VC.

Q: Which spreadsheet is 100% machine code for fast efficient responses, and offers a choice of saving to disk (using 1541 drive) or to tape using a C2N unit?
A: Autocalc 64 — as if you didn't know!

Q: Which spreadsheet sells at a realistic budget price?
A: Autocalc 64 costs just £14.95 on tape, £19.95 on disk inclusive of VAT and P&P.

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A: Ring us now on 06286 63531 (24 hours) to place your ACCESS or VISA card order, or complete the order form and send it to us today. (Prompt delivery promised). Autocalc 64 is available only direct from Richard Shepherd Software.

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CHS-84

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All programs are sold subject to the condition that they may not by way of trade or otherwise be lent, hired out, resold or otherwise circulated without the written permission of Richard Shepherd Software Ltd.

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Cracking the code

Book: *Mastering Machine Code on your Commodore 64*
Author: *Mark Greenshields*
Publisher: *Interface*
Cost: *£7.95*
Reviewer: *C Whitcombe*

I am usually very wary of any book that claims to be able to teach you something quickly and easily, especially when the subject in question is M/C! However, in this instance, the author's claim is not too exaggerated.

The book is well laid out in sections that follow on quite well from each other. The style is easy on the brain and each new topic is adequately explained with example programs.

The book begins with a 'tutorial' of all the Assembly commands and programming modes of the 6510 chip. Also included here is a listing of SUPERMON — a 6510 Ass/Dis/Mon — for you to type in. Unfortunately, I could not get the program to work for me. Although it was being SAVEd on the tape, it refused to come out of hiding when asked to LOAD. There is also a more obvious error that tries to start you off at the wrong memory location. If you don't have an assembler of your own to turn to, you could have a problem.

Section 2 shows you how to use your new-found knowledge to great advantage. Topics covered include Smooth screen scrolls, Sprite manipulation, Interrupts, Music, Rasters and Hi-res graphics. There is also a sub-section showing how to add extra Basic commands. All these subjects are well explained and are shown to work by some excellent routines that could easily be used to good effect within a larger program.

Section 3 contains all the ROM routines and explains how to use them. An Appendix has the usual contents — memory maps, Kernal jump table, ASCII charts, etc.

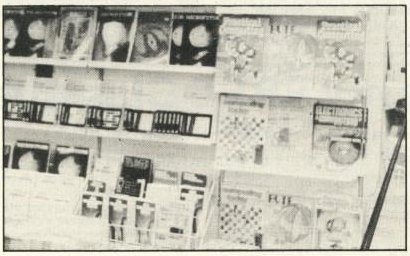
Considering the subject matter, the book is very readable as well as being instructive and I think the author is to be congratulated for his efforts. For anyone wishing to learn M/C on the 64, I would recommend this book ... but with some reservations ... (that SUPERMON listing!

Manual labour

Book: *Getting the Most From Your Vic20*
Author: *Hank Librach*
Publisher: *Prentice-Hall – Micro Test (USA)*
Cost: *£8.95*
Reviewer: *David Shepherdson*

Here is a book that picks up where other guides and manuals leave off''. So reads the publisher's blurb! Personally, I would say that the manual it picks up from is the one supplied with the machine by Commodore. However, if you do not wish to delve quite so deep into the Vic as the Reference Guide takes you, then this book will make an excellent second or third addition to your computing library.

Section one takes you step by step through many small progams. The programs range from simple print runs and how to display these effectively, to quadratic equations, music demos and even how to incorporate a joystick into your programs. The chapter on graphics is



excellent, one of the clearest I have seen. Anyone who is unsure on just how to obtain and use User Defined Graphics should find that this section will answer about 99% of their questions.

In Section two, there are 10 application programs ranging from balancing your chequebook to a maths tester. All the programs should fit into the unexpanded Vic and, as character codes are used in the listings instead of control characters, you should have no problems entering them. One thing I do feel however, is that some of the programs could be tidied up a little and more use could have been made of multi-statement lines. Otherwise, an excellent book for the beginner, and quite a useful book for the more advanced user.

Worthy but dull

Book: *Basic Subroutines for Commodore Computers*
Author: *Eddie Adamis*
Publisher: *John Wiley*
Cost: *£10.50*
Reviewer: *Osman Durrani*

Eddie Adamis makes no claim to harness the Vic – Pet – CBM's graphics or sound potential. His *Basic Subroutines* constitutes a 'no frills' library of modules designed to facilitate sorting and conversion operations of the 'square kilometres to square miles' and 'Dynes to Newtons' type. They will run on most members of the Commodore – Pet family and, with minor amendments on many other 'Basic' micros.

If you are the kind of chap who regularly needs to convert, say, Rankine degrees into Kelvin degrees, you will probably be able to do so on your pocket calculator in half the time. But — nice touch this — Adamis has devised a canny little routine that automatically corrects your spelling of tricky words like Fahrenheit or Reaumur.

The range of subjects covered in these 300-odd pages is impressive; topics include angles, area, business profits, capacity, energy, compount interest, logarithms, pressure, volume measurements and many others.

A useful reference tool to have on your shelf, should you ever need a program to calculate your amortization schedule or render millimetres or mercury into Newtons per square metre (sorry, meter), but one which, I fear, offers little genuine benefit and still less fun value to the average micro user.

Well in advance

Book: *The Advanced Commodore 64 Handbook*
Authors: *Peter Lupton and Frazer Robinson*
Publisher: *Century*
Cost: *£6.95*
Reviewer: *Phil Bonner*

Let us suppose you are an enthusiastic user of the 64, who is proficient in Basic and would like to go further. You have examined Commodore's *Programmer's Reference Guide* but finds parts of it too technical. You would particularly like to experiment with sound and Hi-res graphics, in Basic and Assembler, to understand the Basic Interpreter and to add a few extra commands to Basic. The trouble is that you have been unable to find a suitable book to assist you.

Look no further! This superb volume is the very thing you need. Intended as a companion to the *Commodore 64 Handbook* by the same authors, it stands on its own as a well-written, informative and useful volume for any 64-owner's bookshelf. As well as covering the points mentioned earlier, it provides a comprehensive guide to the use of disks and printers in a manner far superior to Commodore's own offerings. Add to this numerous listings of program examples and utilities, and you have a publication which is hard to resist.

This is indeed a book to dip into at random and explore in depth. It is packed with information presented clearly and logically, with several helpful appendices. It would almost be worth £6.95 for the Hi-res routines alone. My only criticism is of the index, which is practically non-existent, but compared with the rest of the book this is a minor irritant. Highly recommended!

CLASSIFIED

SOFTWARE

COMMODORE 64 DATABASE — DATAFILE

Powerful options include: print all/selectve records, delete, amend, save, load, copy, alphanumeric sort, user defined fields, memory check, total numeric fields, multi field interrelational, global and between limits searches, etc. Fully menu driven with comprehensive easy to use instructions.

CBM 64 (compiled) cassette £7.45
CBM 64 (compiled) disk £10.45

COMMODORE 64 WORDPRO — TEXTFILE

Powerful word processor, facilities include — large text buffer, auto centre, variable tab, insert, amend, delete, copy, move text word count, right justify, paging, join files, multiple file handling, print all/part text etc. Fully menu driven with comprehensive easy to use instructions. Great value.

CBM 64 (compiled) cassette £8.25
CBM 64 (compiled) disk £10.75

All programs with full documentation and guarantee and can be used with all direct connect CBM64 printers including 1520 printer/plotter. Also most centronics (with suitable hardware interface). Price includes fast delivery by first class post. Cheques/PO's to: **A & C SOFTWARE**

51 Ashtree Road, Tividale, West Midlands B69 2HD

COMMODORE 64 software to sell or swap, titles include Manic Miner, Hunchback, Spriteman and many more. Send list to Tony Storton, 13 Nightingale Walk, Chells, Stevenage, Herts. SG2 0QE or phone Stevenage (0438) 359583, after five p.m.

FORBIDDEN Forest, Aztec Challenge, Grid Trap and more for the CBM 64. For sale or exchange. Send SAE for full list. Finn Choong, 11 Winleigh Road, Handsworth Wood, Birmingham B20 2HN.

COMMODORE 64 software for sale. Wimbledon £4.50, Siren City £3.50, Star Commando £4, Hustler £3.50. Together sell for £13.50. Contact S. Sung, 1 Hurly Hawkin, Bishopbriggs, Glasgow G64. Send SAE with postal order if sold, money returned.

SIMONS BASIC. Unwanted gift. Still in box, and used once only. Will sell for £30 or swap for "Micro Assembler" cartridge. Tel. 01-890 1436.

TODDLERS! PLAY WITH YOUR PARENT'S CBM64. ANIMATED, MUSICAL FLASHCARD AND SPELLING PROGRAM, DEVELOPED IN CONJUNCTION WITH SCHOOL AND EDUCATIONAL PSYCHOLOGIST. SUITABLE 1½-7 YEARS. CASSETTE £4.50 DISC £7 FROM **TODDLERSOFT, 1 CATLANE COTTAGE, EWELME, OXON OX9 6HX.**

COMMODORE 64 games for sale. Many titles — Atarisoft Defender £10. All others £5 inc. Solo Flight, Loco, Blagger, Chuckie Egg, Aquanaught, Guardian, Wallie Goes To Rhymland and many more. Tel. Trowbridge 69912 after 4 pm.

SWAP Vic 20 software — over 70 titles. If you are interested in expanding your collection send a list of the Vic 20 programs you have available to swap to Steve Willis, 12 Lansdowne Road, Chatham, Kent ME4 6LH.

64 MONITOR

A machine code monitor for the CBM 64 designed to meet the needs of both the beginner and expert m/c programmer. Supplied with a 40 page explanatory manual.

The 64 monitor offers all the usual commands inc: Assemble, Disassemble, Fill, Transfer, Hunt, Memory, Load, Save and 60 etc. Supports cassette, disc, printer — supplied on tape for £5.95 or disc for £7.95.

HORIZON SOFTWARE
15 Bamburg Close, Corby, Northants NN18 9PA

FOR SALE Commodore software tape indexer, security 64 database, list is to endless to print. Write/phone: Alan Williams, 16 Hedge Hey, Runcorn, Cheshire. Phone: (09285) 67734. 6-8pm.

COMMODORE 64 software for sale. Top British titles and some American. All originals. Also books and software for Vic 20, including introduction to Basic. Phone 0365 23367 evenings. Ask for Graeme.

COMMODORE 64. English software wanted for exchange for American software. 300 + titles to choose from. Send list to Martin Duffy, 3731 Park Ave., Wantage, New York USA.

VIC-20 Educational Software for sale. 'O' Level Revision tapes, maths, English language and biology. As new. £5 each. They worked for me! Tel: 0202 742452.

COMMODORE 64 games, software, to swap or sell, many titles including Spriteman, Pole Position, Hover Bovver, International Soccer and many, many more. Phone: Tony at Stevenage (0438) 359583 after 6.

CBM64 software, originals, hardly used, Ultisynth £10, Grand Master chess £12, Mastercode Assembler £10, Disco £6, Arcadia 64 £4, Gridrunner £4, A.M. Camels £4, Cyclons £3, Welwyn Garden City 34637.

COMMODORE 64 games for sale. Many well known titles. Please send SAE + 10p to Andy Worth, 93 Glocester Rd., Nth Ficton, Bristol BS12 7PT. (All games very cheap).

COMMODORE 64 unwanted software Hustler, Depth Charge, Manic Miner, Quintic Warrior, Labyrinth, Mr Wimpy, Hungry Horace, Sooper Froot, Laser Zone, Maggotmania. All as new. £35 the lot. P. Taylor, 212 Farnborough Rd., Clifton, Nott'm.

SIMPLYFILE and Simplewrite disk programs for CBM64 and 1541 unit with manuals. Worth £110 new will accept £75 or £45 and £30 respectively. Reason for sale, changing system. B. Rosindell, 31 Beacon Close, Amesbury, Salisbury, Wilts. SP4 7EG.

CBM64 software for sale. Lazarian, music composer and clowns cartridges. £17 the lot. Brand new. Tel. 0790 53161 after 4pm.

COMMODORE 64 software to exchange or sell titles include: China, Miner, Pilot 64 and 'O' level Physics.

VIC 20 software for sale. Omega Run, Cosmic Cruncher, Gorf. All three for £15. Phone 01-639 3778. After 5.30pm.

64 SOFTWARE for sale. Galaxy Dungeons, Kong, H. Horace, Scramble, Arcadia, Neoclps. All reliable. As new. £3.50 each. Tel. Abson 2587 after 6pm.

CBM 64 Simons Basic for sale £30.00. Also various software. Phone for details, Bracknell 489173.

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COMMODORE 64 games to swap. Over 60 games. Titles include Hobbit, Falcon Patrol, Hungary Horace, Manic Miner and lots more. Contact Jim Donaldson, 14 Richmond Parade, Carnmoney, N. Ireland BT38 8CB or Tel: Glengormley 6689.

CBM64 Software for Sale, all half price: Token of Ghall, Siren City, Kong, Skramble, Hexpert, Stellar Wars, Hover Bovver, Black Hawk, Solo Flight, Lemans, Lazarian and more. Tel: Crayford 56911 after 6 pm.

COMMODORE 64 Software for Sale. Titles include The Hobbit, Beach Head, Manic Miner, Heathrow Air Traffic Control, Hunchback, Flight Path 737, Splat + more. All in excellent condition. Tel: Porth 685012. Evenings only please.

VIC 20 Software. Puckman & Skyhawk, interested in these games? Buy both for £9.95 or £5.00 each + Atari Joystick and Paddles at £7.50 each. Also looking for Vic 20 Speech Synthesiser at reasonable price. Phone (041) 776 4624 after 6.00 pm or write. Paul Taggart, 7 Northbank Ave., Kirkintilloch, Glasgow, G66 7HA. (SAE).

WANTED

WANTED Simon's Basic, Gorteck, Fun, Mathematics Intro to Basic Part 1 and anything similar. Tel. 0242 522700. CBM64 only (tapes or cartridges). Phone between 5pm and 9pm only.

WANT TO SWAP Commodore 64 games with someone in America. Please write to: Martin Smith, 55 Ridgeway Walk, Topvalley Estate, Nottingham.

WANTED C2N Recorder, in good working order. Will pay £20. Tel. 0865 54084.

WANTED

READY PROGRAMMED COMPUTER GAMES FOR THE COMMODORE 64. FOR INFORMATION PHONE KATIE ON ESHER (0372) 68654.

ITALIAN 64 user desires to exhange quality CBM 64 software on disk preferably. Please send your list.

FOR SALE. One box of ten memorex double sicied density unused 5¼" discs as new. £25. 01-941 6079 evenings.

WANTING TO swap Scott Adams' Voodoo Castle for any other Scott Adams Adventure cartridges for the Vic 20. Write to A. Wilkinson, 27 Woodsome Estate, Batley, W. Yorks.

HAVE YOU got 'Scope' or 'Lewdo' for the CBM 64, if so I will buy, hire or swap them from you: Phone 036565594 any day apart from Friday and Saturday after 9pm.

SWAPS: CBM 64 games to swap free. Contact Paul on 021-329 2306 or write to 29 Reddicap Hill, Sutton Coldfield, West Midlands.

WILL SWOP 480 channel CB rig AM/FM USB/LSB with Mike power pack and homebase aerial plus 60 watt burner for either 15230 printer plotter or Simons Basic cartridge. Phone (021) 772 6981 or 384 2394. Phill Cotterill.

TS-788DX SOMMERKAMP tranceiver 26.000 mhz to 29.999 mhz AM, FM LSB, USB and CW 10W & 100W. Swap for CBM 64 disc drive, Simons Basic and disc based software. 13 Dilworth Close, Summit Heywood, Manchester.

SWAP CBM 64 software. Please send your list to: Fernando Forner, Via Valperga, Calvso, 21, 10125 Torino, Italy.

VIC 20

VIC-20 24K RAM, 3-Slot Mother Board, Forth Cartridge, Super Expander, 40-column board, programmers aid, lots of software including Vicfile Books including reference guide, Vic Revealed. £350 ono. Tel: Ruislip 32649. ASk for Liam Graham.

VIC-20 CPU + C2N + 16K Switchable Rampac + Joystick + Software. Also introduction to Basic Part 1. £120 ono. Tel: Immingham (0469) 72854.

FOR SALE VIC 20, Cassette Deck, 16K RAM, Quickshot, Intro to Basic 1 & 2, Prog, Ref Guide, Assembler Tutorial, Software, Dust Covers £160 ono. Aldridge 54484.

VIC-20, 16K Ram, Cassette Recorder, Super Expander, Programmers Aid, Atari-type and Triga Command Joysticks. 2 games cartridges, 8 top quality arcade games, plus Chess, Snooker and Flight Simulator. Offers welcome. Tel: (John): 0380 850050.

VIC 20 COMPUTER, 4 cartridges includes Cosmic Cruncher, Sargon II, Chess, Star Battle, Gorf, Le Stick Joystick and Vic revealed. Quick sale price £60. Phone Wakefield 363466.

VIC 20 starter pack + £160 of games. E10 Joystick + switchable 16K RAM + books, excellent condition. Only £200. Saves £160 (0255) 429264.

VIC 20 16k switchable rampack plus software including 737 Flight Path plus cartridges and also maths and physics plus money manager and some books, all for £60. Contact Steve on Cupar (Fife, Scotland) 54139.

VIC 20, cassette (C2N), 16k switchable RAM, 4 ROM cartridges, 14 cassettes. (Games) inc. Jetpac, Computer War and mags sell for £225 o.n.o. Phone 0793 692891 after 6pm.

VIC-20 with 16k switchable expansion, intro to basic one, seven top games and other software. Hardly used, all excellent condition. Total price £110 or separate. D. Chambers, 11 Thetford Rd, Mildenhall, Suffolk, IP28 7HX, or phone 0638 714051.

VIC 20, cassette recorder, games, all leads. Sell for £100 ono or swap for 48K Spectrum. Phone 0349 882096.

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REGULAR MONTHLY AUCTIONS FOR ALL MICRO HARD AND SOFTWARE. SEND NOW FOR ENTRY FORM OR NEXT CATALOGUE. TO:

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Tel: 01-242 0012 (24 Hours)

COMMODORE 3022 printer, new printer head fitted. Printer in v.g.c. £140 or near offer.

DISKS unused, BASF, 40 track, single sided and density £1.69 + 16p p&p per disk. Ring Mark Asteris on Emsworth 5897.

1520 printer plotter for Vic 20, CBM 64 spare paper. Draw or write with 10, 20, 40, 80 character options. 2 months old, £80. Phone 0304 813098 will consider swap for 64 hardware add on's. Phone for details.

I HAVE Alert 64 for sale, use CBM 64 to secure your home and property. Can also be used as a fire alarm in home. Send £4.50, large S.A.E. to James, Strang, 165 Ashtonhill Lane, Droylsden M35 6FH.

ACCOUNTS PACKAGE by Micro-Simplex £50. Videopak 80 column w/p £50. Both for CBM 64. Sipod Interface, lets you use Pet peripherals with the CBM 64, £10. Tel: Stevenage 720573.

PRINT OUTS for CBM 64 £1 each. Send SAE to Garry McPheators, Clelland Park, Mauchline, Ayrshire.

1540 DISK DRIVE for use with Vic 20. Leads and manual included. Only 16 months old. Good condition. £150. (Useable with Commodore 64 with upgrade ROM kit). Tel. Weybridge (0932) 48118.

FOR SALE: 1 Vic 20 or CBM64. Dust cover, brand new. £3.50 and 1 blank C60 cassette 70p or both £4.00. Write to: David McKenzie, 18 Oxhill Place, Keil Park, Dumbarton, Scotland.

COMMODORE 1540 disk drive, 5 disk. Excellent condition. Still boxed. £1.25 ono. Phone 518 6213 evenings only.

COMMODORE 64 with cassette unit, software dust cover, books, joystick and black carrying case. Perfect condition for £240. Tel (0332) 280340.

FOR SALE CBM 64, 1541 disk drive MPS801 printer, under guarantee until Jan. 1985. Sale includes 'High Flyer' word processing program and blank disks. Offers over £400.00.

VIC 20 on C2N unit 16K switchable RAM pack joystick, books, cartridge (count). Tapes: Arcadia, Catcha-Snatcha, Frantic, Skyhawk, Jupiter, Defender and many more. Phone Sheffield 86 2407. £140.

CBM 8096 computer with dual disk drives. One year old. Also brand new (boxed) 1541 single disk drive. Quick sale required so negotiable on price. Tel. David on 041-638 2745 (evenings).

COMMODORE 64 for sale. A new original concept, 'Strobe 64'. A simply brilliant cassette at only £3. Send to D. Rarity, 148 Deans South, Deans, Livingston, West Lothian EH54 8DX.

ADMAN speech synthesiser, hardly used. I month old. Will use allophones and unlimited vocabulary. Will accept £20. Tel. Suraj 743 8832.

CBM64 1526 (MPS802) near letter quality printer. 2 months old £275 ono. Phone 01-533 2425.

COMMODORE 64 owner O.U. student aged 40 wants lady pen pals or exchange computer tape messages. All replies answered. Mike Peters, 37 Brattleby Crescent, Ermine East, Lincoln LN2 2EB.

CBM64 and Honeyfold Assembler + C2N and over £120 of books + software. Mint cond. 92 Blake House, Salford 70RX Gtr. Manchester.

APPLICATIONS

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Interface control unit and S/W only, £69 inc VAT, P&P £2.50.

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MICRO-SECURITY
PO Box 18, Havant, Hants PO0 3LB
Dealer enquiries welcome.

ANSWER BACK

Cricketer stumped

I HAVE THE complete records of my cricket club going back 55 years. Using my 64 I should have no difficulty in storing details of every match, but I should like to be able to sort out individual performances and accumulate career statistics for the players — several hundred over the years. Can you advise me on a program which would carry out this statistical sorting, collating and averaging, or do I have to set about working out my own program?
D J Rees
Bristol

THERE ARE several commercial databases which could help you out, such as Superbase and VizaStar. However, you will have severe limitations if you're using a 1541 disk drive because of the amount of information you need to store.

You may need a CBM 8250 double disk drive which can be driven from a 64 using say a JCL IEEE interface.

It may be possible to use a 1541, but it would require a lot of planning and you would have to use many disks, with the restricted sorting which would result. If you use one record per match, and each record stores details of players, scores, and so on, then you multiply by the number of matches per year and by 55 years, you'll find that an enormous amount of disk memory is required! If you have to use several disks, you're limited by to searching one disk at a time.

Two pass assembler

I USE THE Doctor Watson series assembler from Honeyfold on my Vic 20. Recently I have read about a new program with a "two pass" assembler. Could you explain the difference between "two pass" and a normal assembler?
K J Thornicroft
Hampton Magna
Warwickshire

MOST ASSEMBLERS use the "two pass" system by which forward addresses are calculated on the second pass. Using a label for a forward address which is not defined until later in the program cannot be dealt with by a single pass assembler, which would report an error instead. One pass assemblers can only deal with already referenced labels, but the two pass assembler has the reference from the first pass.

Don't overwrite

I HAVE A 64 and am learning machine code using the assembler printed in May's Commodore Horizons. However, I don't want to destroy any of this program when I store the machine code. So how do I protect the Basic program from overwriting?
T G Watts
Rochester
Kent

TRY USING the positions $C000 to $CFFF, which gives you 4096 bytes for code. Alternatively you could lower the top of Basic to protect your machine code programs from being overwritten by Basic variables. To lower the top of Basic to 32768 ($8000) POKE 56,128, and then you can also use $8000 to $9FFF for your programs.

Brother Vic

I HAVE a Brother EP22 electronic typewriter, which I wish to link to my 64 and use as a printer. However, none of my local Commodore or Brother dealers has any idea as to what cables are needed to link the two. The EP22 has RS232C and several adverts and reviews have mentioned that it is compatible with the 64.
David S Cooper
Wokingham
Berks

YOU WILL need a Vic 101A cartridge, available from Commodore dealers. This cartridge plugs into the user port of the 64 and converts the 5V and ground outputs into the plus or minus necessary for RS232 standard.

The cable should be connected as follows. use an RS232 cable with 25 pin D type connectors. At the printer end connect up pins 2 (transmit) 3 (receive) 7 (ground) and 20 (data terminal ready). Your printer user manual should show which pins relate to the above.

At the computer end connect pin 5 (clear to send) to the wire from pin 20 (printer), otherwise as above.

The wires to pins 2 & 3 may need to be crossed over depending on which way the printer interface is implemented.

Superbase sorted

I AM HAVING a problem with the Superbase program. Having loaded the program from disk and inserted one of my own data disks, I can print or display across 80 columns once only. The output then defaults to 40 columns and no primary or secondary command of any sort will cause the output to restore to 80 columns. It needs a QUIT and reload to do the trick.

My second problem is an inability to get any printout from cartridge-loaded programs. CalcResult and Diary 64 from Handic are both 64 compatible, but despite trying all combinations of device numbers I invariably get the message "DEVICE NOT PRESENT". Both programs behave perfectly otherwise. If the difficulty is one of printer incompatibility, how come I can achieve excellent printout over 80 columns from Easyscript? Finally, what are the pro's and cons of disk and cartridge?
Robert Law
Cork
Ireland

VERSIONS OF Superbase for the 64 previous to V. 1.09 have a problem with Centronics interfacing. Contact Precision Software, 01-330 7166, and they will arrange an exchange for an updated version. It may be that the Handic programs also have some difficulty with your Centronics interface — contact Handic on 0344-778800 to check.

Cartridge loading is by far the quickest and most reliable form of software loading. The main disadvantage is that careless connection and disconnection of cartridges may lead to damage of the cartridge slot. You could consider investing in a switchable multi-slot motherboard to alleviate this problem.

1520 and Easyscript

I HAVE JUST bought Easy Script to use with my 64, 1541 disk drive and 1520 printer/plotter. Problems arise when I try to print on the 1520, with odd messages appearing on the status line. The 1520 itself is working adequately.
Margaret Fegen
Paisley
Scotland

HAVING checked Easyscript on my 64 and 1520, I can advise you that it should work as follows. Press "F1" and "0" for output, then "d" to set the device number. Enter 6 in response then RETURN, and exit from output mode until you have entered the text you want printed.

You'll need to use secondary addressing to use the 1520 with Easyscript. Examples; (each one to be preceded by the control character) sa2,48 gives pen colour BLACK; sa2,49 gives BLUE; sa2,50 GREEN; and sa2,51 RED. Using sa3,48 gives 80 characters per line; sa3, 49 gives 40; sa3,50 gives 20; and sa3,51 gives 10. Finally, sa7 resets the plotter.

If you need help with a technical query or problem write to Jack Cohen, Commodore Horizons, 12-13 Little Newport Street, London WC2R 3LD

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Falcon Patrol – 'A fast action and compelling game which I highly recommend' *Personal Computer News*. **Hideous Bill and the Gi-Gants** – 'It is very addictive and like Falcon Patrol the use of sound is superb' *Home Computing Weekly*. **Mission Mercury** – 'This is one of the few home versions that is actually an improvement on the arcade version, with better graphics and improved action' *Video*. **Envahi** – 'This game is exciting and demanding and an absolute must for any serious computer games player' *Personal Computing Today*. **Creepers** – 'It really does become compulsive' *Your Computer*

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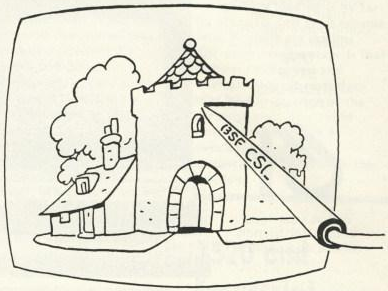

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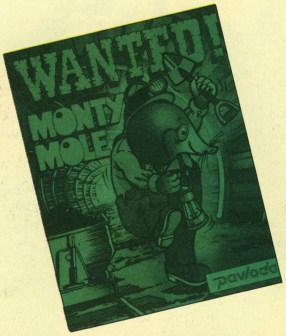


LIFE IS never boring at the Hell Nook Micro Club . . . this month they're all playing Dungeon Adventure, and things have become so heated that Xerxes, Yvonne and Zoe have all built cardboard models of the Dungeon in an attempt to outwit the others.

One of them has got it wrong, however, and will come to a sticky end. Look at the three diagrams and decide which is the odd one out — each maze is viewed from a different angle, remember.

If you think you've solved the puzzle, complete the tie-breaker in an apt, amusing and original manner in fifteen words or less, and send your entry with your name and address to Competition Corner, Commodore Horizons, 12/13 Little Newport Street, London WC2R 3LD.

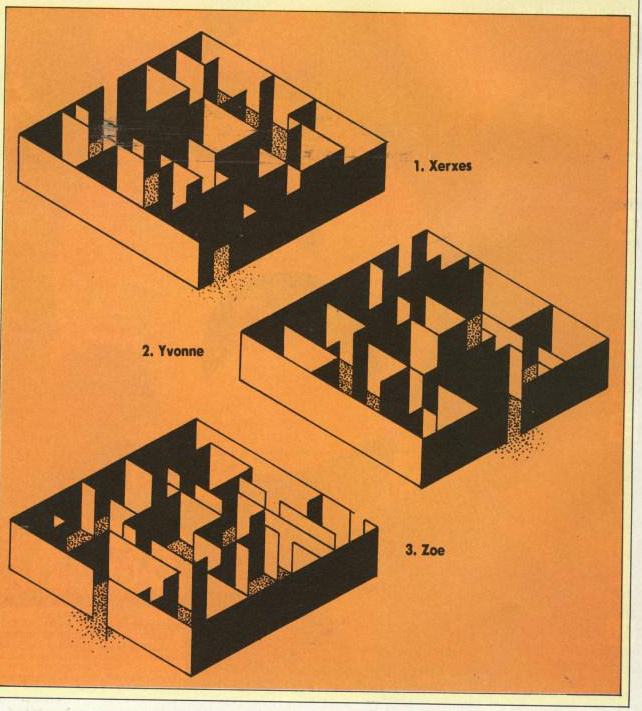
Ten lucky winners will each receive copies of the Gremlin Graphics games for the 64, **Percy the Potty Pigeon** and **Monty Mole,** which cost £7.95 in the shops.

Percy the Potty Pigeon is a fast-moving arcade game written by Tony Crowther, in which you must help Percy build his nest and avoid speeding cars and other hazards. Monty Mole features Mr Arthur Scargill and his Flying Pickets, out to stop poor Monty from collecting coal from the dangerous mines. It's another Tony Crowther spectacular.

So the tie-breaker is: 'I'd like to run a Gremlin through my 64 because . . .''

Normal competition rules apply.

The winners of August's **Micronet** competition are Simon Jeffery of St Austell, Caroline Butterworth of Bognor Regis and Steve Cowell of Widnes. Each winner will receive a communications cartridge and modem which will enable the 64 to be linked to the Micronet network service.



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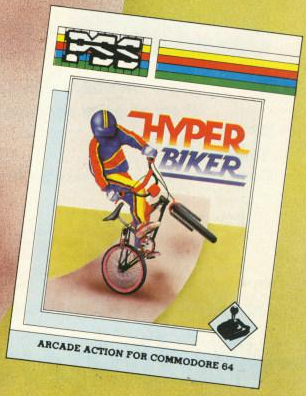

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